BRITISH MEDICAL JOURNAL

LONDON SATURDAY FEBRUARY 25 1939

HEALTH AND THE STATE*

BY

The Right Hon. WALTER ELLIOT, *M.C.*, LL.D., D.Sc., M.B., F.R.S., M.P.
Minister of Health

The profession of medicine is one of the most individualistic of all professions. The relationship between doctor and patient is a highly individual relationship, with something of a religious character, even though the doctor has long ceased to be actually a member of the priesthood as he was in earlier times. In a country such as ours it is a very good working rule—and indeed it is more than that: it is a fundamental principle—that individual enterprise should not be interfered with by the State unless that enterprise is either injurious to others or to the community, or is failing to deliver the goods or services which the community requires. I think this principle is generally observed in the relations between the general practitioner and the State. The State or municipality can lend organizing power, and it can supplement the work of the individual by making available facilities which the individual could not provide for himself or by creating conditions in which the individual can make a more effective contribution to the common good. But the State is not, as is sometimes supposed, a bureaucratic machine trying to bring everything under its control because of a blind worship of the Unknown God of tidiness, and, although it is sometimes accused of adding every year to the number of things in Acts of Parliament which are subject to the approval of the Minister of Health, much of the time and energy of Ministers and their Departments is in fact spent in resisting the acceptance of such control or jurisdiction because it is clear that the public interest, which must be paramount, does not require it.

The Beginnings of Hygiene

The history of this subject goes back very far. The Book of Leviticus is a compendium of early sanitary law. Moses has been rightly termed the first Minister of Health. He enforced compulsory notification and set out in detail systems of isolation and of disinfection of patients and their dwellings. Why was this? It was because he was dealing with a closely settled community—an encampment is a very closely settled community—and such are most liable to epidemic disease. Pestilence, in fact, has always been a prime stimulus to the practice of public health.

In England leprosy brought about the establishment of leper hospitals by the ecclesiastical authorities, and the beginnings of our present hospital system and of our method of notification and isolation. Plague demonstrated the necessity for sanitation. The first Sanitary Act was passed by the English Parliament at Cambridge in 1388; it was followed by quarantine laws, by the appointment of scavengers, by sanitary watchmen, and by penalties for the concealment of infected persons.

In Scotland, as elsewhere, the beginnings of health services can be traced to the fear of pestilence. England and Scotland throughout the Middle Ages and down to the nineteenth century were periodically ravaged by epidemics of plague, cholera, and small-pox. During the Black Death it is estimated that about one-third of the population died of the disease. During a part of the eighteenth century one child out of every three under the age of 5 in Glasgow died of small-pox.

The early sanitary enactments (to which allusion has been made) aimed at isolating those who were affected and preventing to the utmost contact between the contaminated and the clean. They were concerned more with the preservation of the healthy than with the recovery of the sick. To illustrate this policy of segregation: the Act of 1427 prohibited lepers from entering towns except to purchase food at specified hours on three days in the week. During the great plague of 1568 the infected inhabitants of Edinburgh were required to remove themselves to the Borough Muir or to the shelter of the Salisbury Crags until they should be "clenyit." A very drastic example of port sanitary control is the decision of the magistrates of Aberdeen in 1585 to erect certain gibbets, "ane at the mercat-cross, ane other at the Brig of Dee, and the third at the haven mouth, that in case ony infectit persons arrive or repair by sea or land to this burgh, or in case ony indweller of this burgh receive, house, or harbour, or give meat or drink to the infectit person or persons, the man to be hangit and the woman to be drowned."†

As need arose the State sought the counsel of leaders of the medical profession and of the Royal College of Physicians in dealing with problems of disease. But these counsels were not organized and comprehensive. They were framed to meet the emergency, although the first foreshadowings of medical officers of health may perhaps be read in Mead's *Short Discourse concerning Pestilential Contagion* (1720), in which he advised the appointment of a Central Council of Health, of "seachers" for those dead of plague, and of special physicians to attend the sick. Mead had been called in by the Government to advise them on the prevention of plague which had appeared at Marseilles and, it was feared, might spread to England. He also advocated certification of infected persons, prompt isolation of the sick, and the disinfection of persons and houses. The plague did not come and the eighteenth century was not to see a Ministry of Health.

Towards the end of that century, however, the industrial revolution had set in. The rapid growth of population in the new manufacturing centres compelled communities to provide sewerage and water supplies, and to pay increasing attention to public cleanliness. A few burghs in Scotland had previously

* The honorary presidential address to the Southern Medical Society at the Victoria Infirmary, Glasgow, on January 26, 1939.

† *Committee on Scottish Health Services Report.* Department of Health for Scotland. Cmd. 5204.

obtained powers to provide these services, but the first general measure conferring such powers on all burghs was the Act of 1833.

State Responsibility for Public Health

A hundred years ago in fact the State was becoming conscious anew of its responsibilities for national health. The Reform Act of 1832 had given power to remedy long-standing abuses. The Factory Commission of 1833 had let light into the shocking conditions of children employed in the cotton trade. The Factory Act of 1833 limited the hours of work for children and recognized the need for independent and impartial inspection by officials. A new and effective principle was thus introduced into the control of evils, whether of industry, of poverty, or of insanitation.

This Factory Act did not abolish all the horrible conditions then associated with industrial labour. A boy or girl of 13 might still be working in the mills from six in the morning till six in the evening for five days in the week. In 1840

"a Lancashire mill-hand had no need to keep his home healthy; he and she could send their little children to work long hours in mine or factory; and the whole household could live as it chose, though it might be infecting all its neighbours."

This Factory Act nevertheless made a beginning in industrial reform, and the Poor Law Amendment Act of 1834 started legislation in preventive medicine. It was largely inspired by the enthusiasm and driving force of Edwin Chadwick, the disciple of Jeremy Bentham. The first Sanitary Commission to investigate the general sanitary conditions of the labouring population of Great Britain was appointed, and Chadwick was the author of the Commission's report. In this report Chadwick described the shockingly insanitary conditions under which the people lived. He pointed out that the people could not be clean because the water supplies were defective; that the annual loss of life by diseases induced by filth and bad ventilation was greater than the toll of lives exacted by modern warfare; that the physique of the younger population suffered from their bringing up in insanitary surroundings; that the effect upon the adult population was to make them short-lived, improvident, reckless, and intemperate; and that defective town cleansing fostered habits of the utmost degradation. Then followed the Public Health Act of 1848, and the establishment of the General Board of Health, succeeded, first, by the Medical Department of the Privy Council, with Sir John Simon as chief medical officer, and, secondly, by the Local Government Board in 1871, of which the Ministry of Health is the successor.

Public Health is a comprehensive science. Many contribute to it—the engineer, the architect, the lawyer, the administrator, the sociologist, the chemist, the physicist, the physiologist, the biologist, the biochemist, and so forth. But the chief contributor is naturally the exponent of medicine. The doctor was at first faced with the problem of treating a disease, a departure from the normal. In order to recognize disease he had to know the condition and state of the healthy body. Hence the importance of anatomy and physiology in the medical curriculum. Next he was occupied in studying the causes of disease: *Felix qui potuit rerum cognoscere causas.* Thence it was a short step to study how these causes might be prevented from assailing the human healthy body—in other words, preventive medicine.

We have just noted the beginnings and progress of active State intervention in public health. It has been remarkable in growth and fruition. It has been fostered, as we have seen, by the work of intelligent lay administrators like Chadwick and by the humanitarian zeal so characteristic of our nation. But the success of State medicine is due largely to two factors: first, the great advance of the science and art of medicine in the last two hundred years or so, and, secondly, the individual and important contributions to knowledge of British medical practitioners.

Pioneers of Preventive Medicine

The foundations of the administrative practice of modern preventive medicine are to be seen in the work of the practitioners of medicine in the eighteenth century. The work of Mead has already been instanced in this connexion, and he was the forerunner of others.

Heberden and Huxham studied fevers; Fothergill described malignant sore throat; Smellie and William Hunter practised and advanced the art of obstetrics, and Charles White applied antiseptic principles to it; Haygarth of Chester introduced notification and isolation of infectious disease; Richard Bradley studied plague at Marseilles; Sir John Pringle began hygienic reform in the British Army; Lind laid down principles for the abolition of scurvy among seamen and the prevention of typhus fever; Sir George Baker wrote on the cause of Devonshire colic and palsy; Sir Gilbert Blane studied the diseases of the Navy; Percival denounced the lack of hygiene in crowded factory towns and initiated "industrial welfare"; and Edward Jenner introduced vaccination for small-pox in place of the inoculation method practised for seventy years before.

Thus much research work had been and was being done in fields where the safety of the community and the interest of the practitioner coincided. We find a medical practitioner, William Farr, building on Sir William Petty's work with Captain John Graunt, *Observations Upon the Bills of Mortality*, the modern science of vital statistics. Farr devised the methods and supervised the actual compilation of our national mortality statistics, introduced methods of tabulation which have stood the test of time, and a classification of causes of death which has been the basis of all subsequent methods. John Snow (1813–58) demonstrated that cholera was water-borne, and by advising the Vestry of St. James to remove the handle of the Broad Street pump stopped the metropolitan outbreak of cholera in 1854. William Budd (1811–80) confirmed Snow's work in cholera, first showed that infection of typhoid can be conveyed by water, and differentiated typhus from typhoid fever before Sir William Jenner's more complete exposition of this subject. Dr. Michael W. Taylor of Penrith in 1858 was the first to trace an outbreak of infectious disease to infected milk. He described a small epidemic of typhoid fever caused by a milk supply, and in 1870 showed that scarlet fever could be spread in the same way. In 1877 Dr. Jacob made a similar observation for diphtheria at Sutton, in Surrey.

There follow the famous series of reports by medical officers of the Central Health Department. The first reports by Neil Arnott, Kay, and Southwood Smith, into the prevalence of epidemic diseases and their relation to poverty, preceded another important series of investigations by Greenhow and his colleagues, under the Privy Council, into epidemic diarrhoea, pulmonary disease, infant mortality, and ague; and also into the four "elementary requisites of popular healthiness," as they were termed—namely, food supply, house accommodation, physical surroundings, and industrial circumstances. They led the way to the new applications of medicine for the removal of nuisances, the prevention of contagion and infection, and industrial hygiene and welfare.

The Part played by Practitioners

It is indeed the practitioners of medicine, and chiefly the general practitioners, who by their observations at the bedside have pointed out the way to preserve health and have proclaimed the need for public health administration in season and out of season with a most laudable

persistence. Nay, more, the comprehensive character of public health legislation and administration, as we see it to-day, came into being through public remonstrances by the medical profession against the disorderly state of the early sanitary laws.

At the instigation of Mr. H. W. Rumsey, F.R.C.S., of Cheltenham, in May, 1868, a certain joint committee which the British Medical Association and the Social Science Association had appointed "to promote a better administration of the laws relating to registration, medico-legal inquiries, and the improvement of the public health," memorialized the then Government for the appointment of a Royal Commission in relation to those objects. The prayer of the joint committee was granted, and on the recommendations of the ensuing Royal Commission the Public Health Act of 1875, the Magna Carta of Public Health as it has been termed, was passed. Here, then, is ample evidence to refute the allegation that the State seeks to drag the medical practitioner at its chariot wheels. On the contrary, medical progress, the wonderful work of private practitioners in epidemiology and the prevention of disease, the influence of the medical profession upon public opinion, direct representations from the profession to the Government on the need for more comprehensive and more effective health legislation, and appreciation by successive Governments of the value and selflessness of the advice tendered by the profession have brought about the State control of public health. Indeed, they made it inevitable.

The Coming of the Medical Officer of Health

Rome was not built in a day; neither was our system of health services brought into being by the shaking of a magician's wand. Take, for example, the appointments of medical officers of health which are now universal throughout Great Britain. They have become an essential feature of our social structure, so essential indeed that no enlightened citizen can visualize being without them. Yet the first medical officer of health was appointed less than a century ago, and the appointment has only been a compulsory one within the lifetime of many of us.

Sir Robert Peel's Royal Commission of 1843, which inquired into the outbreaks of disease in large towns and the best means of improving the public health, had as one of its recommendations the appointment of skilled officers by local authorities.

In 1846 the Town Council of Liverpool procured the passing of a local Act to provide for the improvement and drainage of the borough and for making further regulations for sanitary regulation of the said borough. In Section 122 of this Act provision was made that the town council, with the approval of the Secretary of State, might appoint and salary a medical officer of health. The town council made use of their new power by appointing Dr. William Henry Duncan, a native of Liverpool who had long been known there as a leader in promoting sanitary reform. Dr. Duncan thus has the distinction of being the first medical officer of health.

In 1848 the Corporation of London, always a pioneer in sanitary reform, asked Parliament for powers adequate to the new conceptions of sanitary improvement. That application resulted in the City Sewers Act, which included powers for the appointment of a medical officer of health. To this post Sir John Simon was elected. He served from 1848 to 1855, when he became the first Chief Medical Officer of the Central Health Department. He was the first medical officer of health to write annual reports.

In 1855 legislation promoted by Sir Benjamin Hall, the president of the General Board of Health, required that medical officers of health should be created for all districts of the metropolis. The appointments were sought by highly qualified and in some cases already distinguished members of the medical profession. Among the successful candidates we find Dr. (afterwards Sir John) Burdon-Sanderson, Dr. (afterwards Sir George) Buchanan, Dr. Odling, Dr. Parry, Dr. Robert Barnes, and Dr. Thomas Stevenson, great men who did great work for organized public health.

The Royal Sanitary Commission of 1869–71 in its important findings recommended, *inter alia*, "that every local authority should have at least one medical officer of health, being a legally qualified medical practitioner or possessing such other qualification in medical science as shall be declared by the central authority to be satisfactory."

As one of the results of the Royal Commission's work the Local Government Board was founded in 1871, and in 1872 local authorities such as urban district councils, rural district councils, etc., were set up and the general appointment of medical officers of health by each local authority became obligatory. This requirement was also included in the great consolidating Public Health Act of 1875. Later degrees and diplomas in public health were instituted. These increased the professional status of the medical officer of health. The Local Government Act of 1888 laid down that unless he had held one of certain offices prior to January 1st, 1892, no person should, after that date, be appointed medical officer of health to a county or district of 50,000 inhabitants or over unless he was the possessor of a registered degree or diploma in public health, sanitary science, or State medicine. The latest regulations of the Ministry extend this requirement to all sanitary districts whatever their size.

The large urban authorities and in some instances combinations of authorities (urban or urban and rural) made whole-time appointments. The smaller authorities made part-time appointments from men in general practice. Preceding legislation had in many cases resulted not in the combination of districts served by a whole-time medical officer of health, which was advocated, for instance, by Sir John Simon, but in numerous petty appointments of medical officers whose interest and outlook were necessarily confined to the needs of their own districts. A larger and more co-ordinated local authority was needed for public health administration, and the creation of county councils on an elective basis, with the formation of counties and county boroughs, provided the opportunity. To these new authorities county medical officers of health could be appointed by the Local Government Act of 1888. The appointments were made obligatory by the Housing and Town Planning Act, 1909. The duties of county medical officers then were light—light indeed compared with what is required of a county medical officer of health to-day—for at first the public health powers of county councils were extremely limited. They have been greatly increased by the legislation of the past twenty-five years.

General Progress in Public Health

The years 1875 to 1900 covered a long series of progressive reforms under the direction of the Local Government Board, which supervised especially such local government as related to the public health and the relief of the poor. These reforms comprised general sanitary improvements, pure water supplies, pure food supply, provision of isolation hospitals, public vaccination, the supervision of slaughter-houses and common lodging-houses, etc. Local authorities obtained control over housing, powers to condemn slums and to provide new housing accommodation. Infectious diseases were made notifiable, while port sanitation prevented the admission of fresh disease and plague and pestilence.

In Scotland, similarly, a survey of the Statute Book from 1833 until the end of the century reveals a more or less continuous series of Parliamentary enactments, dealing for the most part with sanitation and the control of infectious diseases. These Acts culminated in the Public Health (Scotland) Act, 1867, "a great landmark in the sanitary history of Scotland." That Act was superseded later by the Public Health (Scotland) Act, 1897, still the principal Public Health Act in Scotland.

These measures were followed by a great improvement in the national health. One of the greatest boons received in this period was the purity of the water supplies. For centuries English drinking water had an unenviable reputation. Henry VII, in the fifteenth century, wrote to Ferdinand and Isabella that the water of England was undrinkable, and therefore the young Princess Catherine of Aragon, betrothed to Prince Arthur, should be accustomed to drink wine. To-day the water-borne diseases have become negligible. Cholera has been abolished among us and typhoid is now a rarity, though we still have to keep on the watch for epidemics caused by "carriers." Personal cleanliness and lessened overcrowding have stamped out typhus, the deadly "jail fever," which spread from the prisoner in the dock to the judge on the bench. Every second person we meet is no longer scarred with small-pox. The general mortality decline and the improvement in the health of the country were indeed remarkable when it is remembered that urbanization was on the increase, a process favourable to the diffusion of infection.

More Recent Advances

The present century also is remarkable for steady and rapid advances in preventive and curative medicine. They have gradually brought all agencies for promoting national health into closer and more helpful control. The tuberculosis work of local authorities includes both prevention and cure; in the child welfare and maternity services the clinician works side by side with the hygienist, and to-day we have to consider the development of maternity services in relation to the Midwives Act of 1936 and the recent report of the Ministry on Maternal Mortality; the insurance medical service is designed for the prevention as well as the treatment of disease, and is now working in closer relation with the public health services. The Local Government Act of 1929 greatly increased the hospital resources of county and county borough councils, and provided for a more intensified co-operation between municipal and voluntary hospitals in a joint war against disease. Thereby the administrative responsibilities of county and county borough medical officers of health have been greatly augmented and extended. It is to be observed, also, that the establishment of the Ministry of Health by the passing of the Ministry of Health Act in 1919 and of the Department of Health for Scotland has largely contributed to this wider outlook upon preventive medicine. The Ministry, for instance, is now a central authority of comprehensive health services which is interlinked and intimately co-ordinated not only with local authorities and the multiple health bodies of Great Britain, but through the Health Committee of the League of Nations and the Office International d'Hygiène Publique with the health services of the whole world.

The conspicuous advances made in medical knowledge have in turn enhanced the potentialities of preventive medicine. Mention may here be made of the wider recognition of deficiency diseases and the new and ever-increasing knowledge of vitamins. Closely associated is the successful treatment of pernicious anaemia by liver therapy. Still another biochemical triumph was the discovery of insulin in 1922, which revolutionized the treatment of diabetes. Orthopaedic surgery is preventing the onset of crippling and treating cripples with new knowledge and new methods. The vital importance of medical research has been recognized by the creation of the Medical Research Council, which has now over twenty years of successful achievement to its credit.

The State and the General Practitioner

It must not be forgotten that the private practitioner of medicine, besides, as we have seen, promoting legislation for health, takes a large share in the national health services. Every medical practitioner has definitely prescribed statutory duties to the State—for example, notification of cases of infectious disease, certification of births and deaths, certification of cases of industrial poisoning, and many other statutory duties in the course of his professional work.

The public medical services employ a large number of private practitioners. The first medical officers of health were part-time practitioners, and as late as 1926 out of 1,450 medical officers of health 1,100 were private practitioners and only 350 were whole-time officers. It is the amalgamation of smaller districts into larger sanitary authorities for the needs of efficient administration that has caused the appointment of the private practitioner as part-time medical officer of health to cease.

The Public Assistance Medical Service employs over 5,000 medical officers for outdoor medical relief, the majority of whom are private practitioners; many V.D. officers are private practitioners also; many private practitioners are attached to the maternity and child welfare centres; two thousand odd are on the Post Office list; nearly 2,000 serve as certifying factory surgeons; a number of private practitioners are employed by local education authorities in the school medical service and 16,000 are engaged in the national health insurance scheme.

The progress of modern medicine has been so rapid that the general practitioner requires a number of ancillary methods of diagnosis and specialist aid in order to treat his patients successfully. In many cases these patients could not afford to pay for specialist aid or laboratory tests. But from the health services the practitioner can get, free of charge, the usual pathological tests done, specialist advice and *x*-ray examinations on tuberculous cases, expert opinion on infectious diseases, removal of infectious cases to hospital, the advice of a consulting orthopaedic surgeon, in many areas that of a consulting obstetrician, and so forth.

With all the general practitioner's statutory duties to the State and his work in the public health services he has remained an individualist. It seems desirable that he should continue to do so.

The Newer Services

But the State and the municipality are taking a hand in the prevention and treatment of specific diseases in care for the individual, and no longer contenting themselves with chaining up lunatics or providing isolation hospitals, with (as we have seen) occasionally the gallows as a robust and economical alternative in Aberdeen. The underlying assumption in those days was practical outlawry or extinction of the individual in the interest of the safety of the rest of the tribe. Yet the modern view is not an entire novelty but also has its roots far in the past. The ancient doctrine of "mayhem" or

"maim," whereby it was illegal to consent to the infliction on oneself of certain operations, indicates the early concern of the community in the health as well as in the sickness of its members.

This, however, was due to the practical interest of the community in its fighting powers, and the new attitude is almost entirely a development of the present century. It includes the school medical service, the ante-natal and post-natal and child welfare clinics, and also the health insurance services covering 16,000,000 citizens. It is a growing shoot—moulded and altered from time to time by the stress of events and the march of time. Two years ago was added, in England, a new service under which fully qualified whole-time and salaried midwives are available either as midwives or as maternity nurses, and subsequently an Act giving even better provision in Scotland. We are now in process of adding yet another general service—a cancer scheme—under which the financial resources of the State and the local authorities will be brought in to make the existing and proved methods of diagnosis and treatment—by surgery, radium, or *x* rays, or a combination of them—available on a much wider scale. With this we hope to join the help of the private practitioner. His patients will be encouraged by the growth of an enlightened public opinion to consult him earlier, and he will have at his service the clinics staffed by doctors specially skilled in diagnosis, to secure in many cases that earlier diagnosis on which often the life and cure of the patient will depend. And subsequently there will be available beds and apparatus, without which the most skilful diagnosis is in vain.

A.R.P. Emergency Measures

But it is not only the growth of knowledge, with its accompanying need for new instruments and methods of precision and new and costly methods of treatment, nor internal social changes which bring about changes in the relation of the doctor to the State. In these latter days world affairs enter, too, into the picture, and the uneasy conditions which find their reflection in A.R.P. also modify the relationship. A measure of State direction and supervision which would be intolerable in this country in peace-time may well be necessary in war and will, I am sure, be loyally accepted by the profession, who can rest assured that those who speak for them will be taken fully into consultation on all such matters.

The Ministry and the Department of Health for Scotland are now responsible for the whole of the casualty organization from the stage when casualties have been collected for treatment. Responsibility for emergency hospitals was assumed in June, 1938 (after making a survey of hospital accommodation earlier in the year), and responsibility for the first-aid posts and the ambulance services was taken over in December. Hospital officers have been appointed for various districts, of which there are five in Scotland, and they have been busy since the summer in working out detailed plans for the best use of hospital accommodation in their areas. They are doing this in consultation with medical officers of health and the voluntary hospitals.

The same process is of course going on in England. Taking a place I recently visited—Manchester—the hospital officer for the north-west region, Dr. Patrick, has submitted his proposals for utilizing to the fullest extent and for expanding the existing hospital accommodation in Manchester and the surrounding district. He has received every possible assistance from the medical officer of health, and the Department are indebted to Dr. Veitch Clark and his colleagues for all the work they have done to push forward the organization of the casualty services, both in the crisis in September and since.

Manchester is well served with hospitals. There are six municipal hospitals, all of them of a good size and three of them with more than 1,000 beds; and fifteen voluntary hospitals, of which the Royal Infirmary is the biggest. This hospital, which has nearly 600 beds, provides magnificent services, and in the event of an emergency would be one of the first-line casualty hospitals. It is estimated that nearly 500 beds could be made available in the hospital for casualty work within twenty-four hours of an announcement by the Government that a state of emergency had arisen. Beds are made available as follows: In the first place hospitals would be asked to send home all the patients for whom continued in-patient treatment was no longer considered essential, and it is estimated that rather more than half of the patients normally in the Royal Infirmary could be treated in this way, thus freeing over 300 beds, taking into account those which are ordinarily vacant. It is not of course at all desirable to send home patients who are in hospital for treatment, and the necessity for it would be deplored; but we do not know what modern warfare entails, and until it is seen how the emergency develops no risk could be taken.

In the second place, patients who were still in need of hospital treatment but who could without injury to themselves be removed to another institution less well adapted to casualty work would be transferred in ambulances, and it is estimated that something over 100 could be so moved from the Royal Infirmary to an institution further from the centre of the town. By adopting a similar policy in all the Manchester hospitals fit to undertake casualty work some thousands of beds could be made available within a very short time. It is not proposed to put additional beds into the city hospitals for casualty work, as if such heavy damage was inflicted that it became necessary to provide additional hospital accommodation efforts would be concentrated on moving patients out of the towns into safer areas—stretchers have already been distributed to Manchester.

Taking the country as a whole, plans have now been made for finding about 200,000 beds in existing hospitals and institutions in the first twenty-four hours by sending patients home and transferring them to other accommodation and by putting additional beds and equipment in the wards, and about another 100,000 later by using ancillary parts of hospitals not at present used as wards. For this purpose 50,000 beds and mattresses have been obtained and are in process of distribution. Orders are being placed for another 50,000 beds and mattresses and for 300,000 blankets, 50,000 pillows, and 150,000 pillow ticks unfilled: 120,000 stretchers have been obtained and distributed.

Other points are:

A booklet on structural precautions has been issued to all hospitals and local authorities.

A circular has been issued to local authorities on first-aid posts and ambulances.

The B.M.A. register now covers 95 per cent. of the profession.

A Dental Emergency Committee is doing similar work as regards dentists.

A Central Emergency Committee for nursing and nursing auxiliaries has been appointed.

Co-ordination of Services in War-time

All this requires close relations between the organizers and the technicians, the doctors, and the State. I am aware that the profession has expressed dissatisfaction with the medical arrangements which were made during the crisis of last September; but these arrangements had to be hastily improvised, and the problem is too big to be met without careful planning. Since that crisis we

have had the advantage of hearing the profession's views, which were stated by a representative deputation which waited upon the Minister for Co-ordination of Defence last November. The Government was then urged first to provide some machinery whereby the demands of the Navy, Army, Air Force, and civilian population for medical personnel could be co-ordinated, and, secondly, that the Central Emergency Committee and the Scottish Emergency Committee set up by the British Medical Association at the request of the Government should be regarded as the sole sources through which these demands should be met. We have gone a long way towards adopting these suggestions. As regards the first, we are ascertaining so far as possible the requirements of the Service Departments in medical personnel, so that they can be related to the demands for the civilian services of the profession. Further, the responsibility has been placed upon the Ministry of Health in England and the Department of Health in Scotland, not only of making plans for the hospital treatment of civilian air raid casualties but also of organizing the first-aid posts and the ambulance services, which must obviously play a most important part in any casualty service. The ordinary peace-time responsibility for seeing that the public health and insurance medical services are maintained remains, of course, with these Departments. Thus so far as the civilian population is concerned much has been done to combine under one single direction the whole of the medical arrangements for meeting an emergency.

As regards the machinery for meeting these demands, we have available in the Central Emergency Committee and the Scottish Emergency Committee set up by the British Medical Association two central and expert advisory bodies. These committees are, as you will be aware, representative of the whole of the profession. But if the committees' advice is to be sound it must necessarily take account of the local conditions affecting the profession. I am glad, therefore, that the British Medical Association has recently advised each of its Divisions to call a meeting at once of the whole profession for the purpose of setting up a local emergency committee, which will also be representative of the profession as a whole in the area, and will thus be able to advise the Central Emergency Committee on questions of personnel from the local point of view.

Apart, however, from a certain amount of earmarking we cannot fix in advance the capacity in which each individual practitioner can best render service in an emergency. We shall, however, do our best in this direction, and Mr. Colville and I are having a meeting with the English and Scottish Central Emergency Committees and representatives of the local emergency committees on February 15 to see in how much detail we can develop our plans for the allocation of medical personnel.

There is, however, one piece of advice which I should like to emphasize, and that is that every practitioner, except, of course, those having obligations to the Forces, should remain at his peace-time post, even though an emergency should arise, until he is asked to do something different. I hope he may rest assured that we are doing everything we can in consultation with the duly accredited representatives of the profession, both local and central, so to organize the personnel available as to ensure that it is used to the best advantage.

To sum up, life and death are the raw materials of the State, and those dealing with life and death must always and inevitably be under some compulsory connexion with the State, call it organization or what you will, both in peace and in war. This connexion, as I have shown, is very old and is still actively developing almost every hour to-day. Since that is so the relations between both the medical profession and the State must be as cordial and as personal as can be accomplished. That is why I have taken this long road to see you and speak to you to-night.

THE TREATMENT OF TRICHINOSIS

A REVIEW OF METHODS

BY

VERNON D. van SOMEREN, B.Sc.

Research Student, Department of Parasitology, London School of Hygiene and Tropical Medicine

In countries where trichinosis appears still to be widely prevalent, as in the U.S.A., the majority of cases generally are of a symptomless subclinical type, and as such are discovered only by post-mortem examination or by use of the Bachman intradermal test. Naturally such cases do not come within the purview of the general practitioner, but every now and then the disease assumes epidemic proportions of a more or less severe character, while severe sporadic cases are also not uncommon where meat inspection and proper cooking of pork are not rigidly practised.

Since such cases are seldom diagnosed during the incubation period, but only during the acute migratory phases, immediate treatment is essential to prevent the onset of graver complications in an already debilitated patient, and the fact that a wide variety of methods have been tried is in itself indicative of the present experimental stage in the treatment of the disease. Such experimentation may possibly have unfortunate results; hence it seems advisable to summarize the available knowledge concerning treatment and indicate the more hopeful lines of progress. It is proposed to deal only with methods specifically directed against the parasite in the body, and not with the purely symptomatic clinical treatment: this latter, however, may briefly be summarized.

Trichinosis being a disease inducing a febrile state, a general fever regimen should be followed, and since the symptoms are those of a more or less profound toxaemia, all necessary supportive measures should be provided, followed by a prolonged convalescence period. The bowels should be kept open and alkalinized, and special attention paid to the kidneys. Heart and respiratory stimulants should be provided, and sterile saline given to counteract dehydration (Craig and Faust, 1937). Muscular pains and fever associated with the late migratory and early encystment stages of the disease should be relieved by sedatives and antipyretics, though it is of note that salicylates are of little use in these respects (Herzberg and Vitenson, 1930). Possible allergic symptoms may be controlled by the intramuscular injection of 0.5 to 1 c.cm. of adrenaline, as often as the somewhat transient improvement might demand; while meningismus, a not uncommon feature of the syndrome, might be ameliorated by lumbar puncture (Fantus, 1935). The patient should be kept on a high-calorie diet (McDonald and Waddell, 1929).

While measures directed to support and perhaps increase the natural resistance of the host to the parasite are the most valuable in the present state of knowledge,

it is not surprising that a variety of methods have been tried to secure destruction of the parasite in the body, with varying results. Trichinella parasitizes the host in two distinct phases. There is at first an intestinal phase, during which most of the ingested larvae mature and the resulting adults live and reproduce in the mucosa and submucosa of the intestines—a phase lasting several weeks in man; this phase gives rise to a subsequent and partly coexistent somatic phase when the larvae released by the adults in the intestines pass via the lymphatics and blood stream to all parts of the body, finally becoming localized in the voluntary muscles, where they encyst, and, after several years, calcify and die if not reingested by another host. The existence of these two phases complicates the therapy of the disease; the localized intestinal phase appears in general to be more subject to destructive measures, although the habitat of the adults deep in the mucosa and submucosa and surrounded by mucus renders difficult the action of any therapeutic measure directed against them. Another difficulty also arises from the fact that, while most of the adults are located in the posterior part of the ileum, a certain number also live in the large intestine and caecum, especially in massive infections (Roth, 1938); consequently any drug which may be of use against this stage must not be entirely absorbed in the small intestine, but must be capable of acting also in the caecum and colon.

The somatic phase, which is at first widespread and then localized in voluntary muscles, is far less amenable to any form of treatment, and, unfortunately, diagnostic measures are such that the somatic phase is usually well established by the time specific diagnosis is possible. While this phase is immediately the most dangerous, it is advisable still to try measures which may be of use against adults only, as these are potentially dangerous throughout the whole of their reproductive life, and any attempt to lessen the severity of the muscle invasion is a rational therapy. For the same reason any substance which may be lethal to migrating larvae should also be lethal to intestinal adults, but the possibility that the various stages differ in their susceptibility to the same drug should be borne in mind (van Someren, 1938).

Methods which have been tried can conveniently be classified into (1) mechanical, (2) biological, (3) chemotherapeutic, and (4) chemico-biological methods, but it should be stated at the outset that no experimentally confirmed specific cure for any or all of the phases has yet been discovered.

Mechanical Treatment

Mechanical dislodgment or destruction of the various stages of Trichinella in the body has been attempted in two ways, neither of which is more than partially successful.

(*a*) *Radium Irradiation.*—Tyzzer and Honiej (1917) have investigated the effect of radium irradiation, external and internal, on trichinosis of the rat. Irradiation from the surface of the abdomen does not destroy adult trichinae in the intestine, but if started on the second day after infection it exerts a retarding effect on the further development of the larvae, 30 per cent. being immature when compared at corresponding periods with controls. Internal irradiation from the intestine by radon seeds, however, does not prevent development. Encysted larvae are rendered non-infective (not necessarily killed) by 6.6 mc. emanation at a distance of 1.5 mm. through 0.1 mm. steel filtration for thirty minutes. Obviously these results have little practical application, since, unless the initial infective dose is large enough to produce gastrointestinal symptoms (which are not in themselves specific), the disease cannot be diagnosed sufficiently early, even by the Bachman skin test, to enable irradiation to be of any use for retardation purposes, because the larvae become sexually mature in the short space of five to seven days or less; nor would such retardation prevent the ultimate development of a migratory phase. Similarly also the treatment of encysted larvae to render them non-infective is of little use in the human subject. The acute stages of the disease have passed by the time the larvae have encysted, and the short distance of irradiation necessary precludes the possibility of treating the whole body.

(*b*) *Purgation.*—Drastic catharsis, especially in the early stages, but even up to six weeks after infection, has been recommended in the hope that adult worms may be swept out. McDonald and Waddell (1929) have found it effective to give 2 grains of calomel, followed by high colonic irrigation; and Fantus (1935) advises 0.2 gramme (3 grains) of calomel, followed in six to eight hours by 30 grammes (450 grains) of magnesium sulphate, and this by colon flushing several hours later, the treatment being repeated for several days. While such treatment may be effective in the very early intestinal stages, its efficacy after larviposition has started is very doubtful, in view of the deep-seated habitat of the adults during this stage, and the difficulty of an early diagnosis is again a drawback. Flushings and enemas *per se* are of no practical advantage, as they cannot reach those adults in the ileum. The administration of glycerin has been suggested for its hygroscopic properties, but Grove (1925) and Van Cott and Lintz (1914) have doubted the effectiveness of this method, and again the habitat of the adults would seem to make its use of little value.

Biological Treatment

Biological methods of treatment consist in the administration of serums prepared from actively trichinosed or convalescent cases. Such serum treatment has been very highly recommended by Salzer (1916, 1917), who claimed that serum from convalescent human cases removed persistent eosinophilia in forty-eight hours, while normal serum, salvarsanized serum, and saline have no therapeutic value; that convalescent serum gives an almost complete prophylaxis if infection takes place later than twenty-four hours after injection; that convalescent serum mixed with infected meat prevented infection taking place; that in two cases in man such immune serum was curative, causing the temperature to fall in six hours and become normal in forty-eight hours, eosinophilia being reduced in six hours; and that twenty-four rabbits, experimentally infected, were cured in twenty-four hours by injection of immune serum.

These extensive claims for the use of serum were experimentally investigated by Schwartz (1917), who could find no support for any of Salzer's contentions. In view of such conflicting results the use of serum was reinvestigated experimentally by Hall and Wigdor (1918), who agreed with Schwartz in his findings that convalescent serum injections, or such serum mixed with infected meat, does not inhibit development of trichinosis, but concluded that such serum may be of decided value in combating the toxic features of the disease.

This question of the development of immunity in trichinosis and the use of immune serum has been investigated by several other workers. McCoy (1935) found that immunity against the intestinal stages of trichinosis in rats could be produced by intraperitoneal injections of living larvae, or

heat-killed, dried, and powdered larvae. Trawinski (1935) concluded that serum taken from trichinosed rabbits between twenty-five and thirty-five days after infection possessed antitoxic but not anti-parasitic properties, and recommended three subcutaneous injections of 1 c.cm. as a specific therapy. Bachman and González (1936) determined that trichinous antiserum from rabbits conferred no immunity in rats when fed by mouth, nor was convalescent serum from pigs of any use for the same purpose. Dried trichina powder, or intraperitoneal suspensions of dried powder in Coca's solution, similarly were of no use for immunization purposes.

Since the technique of experimentation has differed in such studies, Culbertson and Kaplan (1937, 1938) have investigated the problem, basing their conclusions on actual counts of intestinal adults and larvae in the muscles in relation to known numbers of larvae used for a given infection; obviously a more reliable method, for example, than the study of the longevity of infected animals used as a basis by Hall and Wigdor (1918). Culbertson and Kaplan found that mice were partially protected against Trichinella by injection with anti-Trichinella rabbit serum, a smaller proportion of infected animals dying, and those remaining having fewer larvae in the muscles than controls. Such immune serum appears to act specifically against the larvae maturing to adults in the intestine, 17.6 per cent. of the total of larvae fed maturing in treated mice, as against 36 per cent. in mice treated with normal serum and 37.1 per cent. in untreated controls. The ratio of larvae encysted in the muscles to the number of larvae fed was 44.0 to 1 in immunized mice as against 69.9 to 1 in untreated controls. It seems, therefore, that immune serum does not act on larvae migrating to or in the muscles, since that percentage of infective larvae has already been inhibited in the intestine in treated mice. These authors conclude that the antibody produced is blood-borne and is a generalized response to infection, but that passive immunization has its action locally on ingested larvae developing to adults in the intestine, though such immunity is not complete. It is of interest to note that the natural age immunity shown by dogs is also of this nature, being directed only against development of adults in the intestine (Matoff, 1937). There is some evidence that previous infection may confer partial immunity against reinfection (McCoy, 1931).

Apart from the question whether or not man could be immunized against trichinosis by any of these methods, and how long such immunity would last, the wholesale immunization of groups of persons would be of little practical value, since prophylaxis can be much more efficiently and economically carried out by rigid meat inspection, and more especially by proper cooking of pork and pork products and other possibly infected meat, such as bear meat.

Concerning the value of convalescent antiserum in treatment, the balance of opinion favours the view that serum inhibits parasite development in the early phases of the disease, and is antitoxic but not parasiticidal in the later phases. As to its inhibitory properties in the early phase of trichinosis one is again faced with the disadvantage of not being able to form a diagnosis early enough—that is, before the larvae have matured in the intestine. The incubation period in man appears generally to be twelve to thirteen days (Ferenbaugh *et al.*, 1938), and the Bachman intradermal test—the most reliable form of early diagnosis, since eosinophilia and other features are not evident until larviposition has begun—does not become positive until about sixteen days after infection at the earliest in man (Augustine and Theiler, 1932; Maternowska, 1933). Such a limited period of time during which serum would be of use for this purpose would make it of no significance in treatment unless methods of early diagnosis could be improved.

There remains the fact that serum may be of distinct advantage in controlling the toxaemia of the later stages, could it be obtained. In countries such as Great Britain, where subclinical trichinosis is uncommon and clinical trichinosis rare (van Someren, 1937), the commercial production of serum would be unnecessary; but in other countries, such as the U.S.A., where clinical trichinosis is not uncommon, the commercial production of serum might well be tried. The economic production of large quantities might, however, prove a difficulty, since Trichinella will not develop readily, if at all, in herbivores, such as the horse, used for large-scale production of other serums and antitoxins. More research concerning the possibilities of the use of serum and its keeping qualities is required, and beyond Salzer's contribution no clinical trials of serum have been made.

Chemotherapeutic Methods

A wide variety of drugs have been tried experimentally and clinically in attempts to secure destruction of the parasite in the body, with limited success. These may conveniently be classified into: (*a*) anthelmintics; (*b*) antiseptics, disinfectants, and related substances; (*c*) organic arsenicals and similar substances; and (*d*) miscellaneous substances. In general, the doses which have been used are not given below, since these have all been in accordance with recognized clinical practice, correspondingly reduced for experimental trials in animals. The total doses used in intravenous therapy have usually been less than those recommended for diseases for which the drugs are specific.

ANTHELMINTICS

It is natural that most of the recognized anthelmintics should have been tried in trichinosis, but the fact that trichinae exist in a tissue phase as well as an intestinal limits the use of those anthelmintics which are only partly or not at all absorbed from the intestine, unless such can be administered safely by the subcutaneous or intravenous route.

Thymol, which has been used extensively with success against hookworm, particularly Necator, but has been stated to have only a slight action on other nematodes (Ascaris) (Clark, 1929), has been recommended as a specific for trichinosis; it has been given per os for the intestinal phases and as a sterile suspension in olive oil for the migratory phases without any toxic effects. Booth *et al.* (1916), Wenderoth (1917), Kahn (1917), Munk (1917), Gruber (1926), Seifert (1929), and Herzberg and Vitenson (1930) have all advocated the use of thymol, or noticed a curative effect in reduction of eosinophilia and other symptoms in man after use. Grove (1925), however, has stated that thymol appears to be of little value, and Baudet (1931) has investigated its effect in experimental rats and found that oral or subcutaneous doses of thymol have no trichinicidal action, nor can thymol hinder the development of trichinosis even when treatment is started one day after infection.

Carvasept, a complex commercial preparation of thymol, has been found by Sprehn (1931) to have an anthelmintic action on both cestodes and nematodes. This substance was also investigated experimentally by Baudet (1931), and was shown to have a rather more favourable effect than thymol, subcutaneous injections of suspensions in olive oil or gum arabic being lethal to adult trichinae; no complete destruction of adults, however, was observed, and since one adult female trichina may give rise to 200 to 300 larvae the use of carvasept could be ameliorative only.

Butolan, a commercial preparation of the carbamic acid ester of *p*-oxy-diphenyl-methane, the active anthelmintic principle of which is *p*-benzylphenol (Schulemann, 1920), was tried in experimental trichinosis of the rat by van Someren (1938) and shown to have a lethal effect on a considerable proportion of intestinal adults with total doses of 1.5 grammes (22½ grains) or over. It does not, however, have any effect on migrating or encysted larvae per os; but in spite of this the substance appears worthy of a clinical trial in human trichinosis, since adults live for several weeks in man and any attempt to lessen the severity of the muscle invasion by destruction of reproductive adults forms a rational therapy. Butolan appears of greater efficacy in trichinosis than the related thymol preparations, and the only contraindications to its use would be evidence of severe kidney damage. It is easy to administer and is relatively non-toxic.

Beta-naphthol is said to have a lethal effect on adults (Chopra and Chandler, 1928), but has not been investigated experimentally. *Santonin*, *aspidium*, and *tetrachlorethylene* have all been stated by Grove (1925), Hardy (1927), and Sogemeier (1938) to be of little use. *Gentian-violet*, which has been found by Faust (1929) to have markedly clonorchicidal properties, and is also specific for *Strongyloides stercoralis*, a nematode having the same deep-seated habitat in the adult stage in the crypts of the mucosa (Craig and Faust, 1937), has been tried intravenously in experimental trichinosis of the rabbit by Miller *et al.* (1932), but has no effective action.

ANTISEPTICS, DISINFECTANTS, AND RELATED SUBSTANCES

Neutroflavine injections were observed by Africa and Lucker (1931) to reduce the degree of muscle invasion in experimental trichinosis, but this was not substantiated by Miller *et al.* (1932), who found intravenous injections of *acriflavine base* and the related *rivanol* to be of no value in experimental trichinosis. *Iodine*, in the form of Lugol's solution or the salt potassium iodide, can be shown to have a powerful lethal effect on Trichinella larvae and adults *in vitro*, but intravenous injections of Lugol's solution or intraperitoneal injections of sodium iodide were found by Miller *et al.* (1932) to be of no value in treatment. *Metaphen*, a bactericidal organic mercury compound, was similarly found by these authors to be ineffective intravenously. *Hexyl-resorcinol* is stated by Sogemeier (1938) to be of no value. *Cuprosal*, a copper-containing antiseptic, was found to be ineffective when injected (Fleischmann, 1930). *Sulphanilamide*, the powerful dye derivative which is now used extensively in the treatment of bacterial infections with the coccal group, has been tried in experimental trichinosis of the rat by McCoy (1938), and shown to be ineffective in controlling the disease.

ORGANIC ARSENICALS AND SIMILAR SUBSTANCES

In view of the pronounced parasiticidal properties shown by the organic arsenicals and antimony salts in the treatment of spirochaetal, trypanosomal, and certain helminthic diseases with widespread tissue infection, many attempts have been made to treat trichinosis with these drugs.

Neoarsphenamine (*Neosalvarsan*) — McNerthney and McNerthney (1916), Algora y Nieto (1924), and Martin (1936) have all reported beneficial results in human cases of trichinosis after intravenous administration of neosalvarsan, the drug appearing to alleviate the symptoms and forming a rational therapy during the migratory phases; but Van Cott and Lintz (1914) and Fleischmann (1930) found the drug useless in human cases, while Miller *et al.* (1932) showed that it was ineffective in destroying the parasites in experimental trichinosis of the rabbit.

Silver salvarsan was found by Ragany (1935) to be effective in eight cases of human trichinosis, but no experimental trials of this form of salvarsan have been made. *Atoxyl* and *arsacetin* are stated by Sogemeier (1938) to be of no value. *Antimony oxide* was tried early in the migratory phase of trichinosis in man by Hardy (1927), but no definite effect was observed.

Potassio-tartrate of antimony (*tartar emetic*) was considered by Grove (1925) to be of some use in trichinosis before localization of the larvae, and Caronia (1937) reports a case cured after treatment with antimony and urges its more extensive use. Hassin and Diamond (1926), however, found it of no use in a human case with nervous involvement, and Miller *et al.* (1932) were unsuccessful in treating experimental trichinosis of the rabbit with this drug.

MISCELLANEOUS SUBSTANCES

Causyth, a commercial preparation of the cyclohexatriene-pyridine-sulphonate of a pyrazolone derivative ($C_{22}H_{21}N_4O_4S$), claimed to be of therapeutic value in certain febrile and infectious illnesses, was stated by Weltmann (1931) to have a favourable effect in a human case of trichinosis, 6 grammes (90 grains) of causyth in 50 c.cm. of water being given per rectum. Baudet (1935) investigated this substance experimentally and found that causyth per os did not prevent development of either intestinal or muscular trichinosis, although given two days after infection. The favourable effect in Weltmann's case was considered by Baudet to be due to an analgesic and antipyretic action of the drug. *Novasurol*, a mercurial diuretic, was reported by Jochweds and Pekielis (Chükri, 1930) to be of use in human trichinosis; but Chükri (1930) found it had no lethal effect on any stages of Trichinella in the rat. *Lecithin and copper*, in a preparation known as lekutylpillen, was found to be of no value by Fleischmann (1930) when administered per os in human trichinosis.

Alcohol.—The liberal use of alcohol in the form of cognac was advocated by earlier writers for the treatment of trichinosis. Pierce and McNaught (1937) showed, *in vitro*, that concentrations of alcohol as low as 9 per cent. interfered with excystment of larvae, but this was possibly due to destruction of the proteolytic activity of the gastric enzymes by the alcohol. A concentration of as much as 25 per cent. alcohol has little direct action on predigested larvae, which can remain alive in this percentage for more than six hours—and this is a strength that cannot be maintained in the stomach for such a long period. Alcohol is therefore of no therapeutic value if the larvae have already been freed.

I have been unable to obtain the paper by Greenwood (1935) on the chemotherapy of experimental trichinosis.

Discussion on Chemotherapeutic Methods

This review of chemotherapeutic methods brings into evidence one striking fact—that many drugs which have been claimed to have a favourable or curative effect in man have been quite ineffective when tested experimentally. There is no reason to suppose that the physiology and pathology of Trichinella and trichinosis in experimental animals are different from those in man, and the experimental test showing the actual destruction of the parasite must remain the decisive factor in determining the efficacy of the drug for the purpose.

In not one case in which favourable results have been reported in man has actual destruction of the parasites been shown, nor have such cases been controlled in any way; while it should be noted that in most uncomplicated human cases the prognosis is favourable and recovery assured, the death rate being low except in epidemics. The favourable effects in all cases have been amelioration of the symptoms, which may be due to a purely symptomatic action of the drug; in some instances the disappearance of eosinophilia has been taken as demonstrative of a curative result. Eosinophilia appears to be a response of the body to the introduction of certain foreign proteins or non-bacterial toxins, particularly of an animal type, and certain chemicals, such as camphor, also are capable of inducing eosinophilia. It has been shown by Banerji (1933) that eosinophilia is dependent on the acid-base equilibrium of the blood as well, and it is a sensitive

reaction which may easily be destroyed by hyperinfection with pyogenic organisms (Spink, 1934). It is not inconceivable, therefore, that the introduction of drugs into the blood stream may also in some way cause the reduction of eosinophilia, and this alone cannot be taken as indicative of a favourable effect. Trichinella is usually lethal to hosts which fail to respond by an appreciable eosinophilia, and possible interference with this defence reaction is to be deprecated.

Miller *et al.* (1932), in their critical study of intravenous therapy in trichinosis, have shown that not only are all the drugs which have been tried useless but that such treatment may be dangerous during the course of the disease. Severe trichinosis produces marked toxic degenerative changes in the kidney, which may well hinder the proper excretion of drugs, particularly those containing the heavy metals. It is also possible, should a lethal drug be discovered, that the migratory larvae, which are of a relatively large size, might, unless phagocytosed rapidly, form fatal emboli, since they are widespread in the body fluids and organs before localization in the voluntary muscles. The possibility of anaphylactic phenomena following any destruction of the parasite in the body should also be borne in mind.

Chemico-biological Methods

For treatment in the later stages of the disease a rather more hopeful line of progress has been experimented with. As is well known, the larvae on reaching voluntary muscles become surrounded by an adventitious fibrous capsule which after several years (in man) becomes calcified, such calcification being followed by death of the larva within the cyst. Until such calcification and death occurs the host may still show toxic symptoms, particularly in the early encystment stage. Use has therefore been made of the parathyroid–vitamin-D–calcium complex to secure forced calcification and death of the parasite within a much shorter space of time than is natural.

Irradiated Ergosterol.—Von Brand *et al.* (1932, 1933) have succeeded in producing cyst calcification experimentally two to three months after infection by daily administration of irradiated ergosterol; and Wantland (1934), using 30 to 60 drops of irradiated ergosterol every other day, together with a dose of 0.5 gramme to 2 grammes of *calcium lactate*, has shown that calcification of cysts in white rabbits may be obtained in less than six weeks, instead of the normal seven to eight months, the onset of calcification being observed in the early part of the fourth week following infection. In white rats (Wantland, 1936, 1938) 40 to 50 drops of irradiated ergosterol alone daily from the fifty-fourth day after infection produce calcification in three months. Larger doses of ergosterol are toxic, and the calcification in rats is not accelerated so much as in rabbits. The results have shown that calcification usually results in death of the larvae, the calcification being subsequently reabsorbed. In cats (Wantland, 1936) doses of 40 to 70 drops of irradiated ergosterol (containing 10,000 U.S.P. units of vitamin D per gramme), together with ordinary milk, given daily from the third day after infection, produce slight calcification as early as the thirtieth day after infection, and medium to marked calcification fifty to fifty-five days after infection. Toxic symptoms were, however, noticed with these doses of ergosterol.

Irradiated milk produces no early calcification in cysts in cats, though the cysts become slightly thicker at the poles than in controls (Wantland, 1936).

Parathormone (subcutaneously) plus *calcium lactate* does not accelerate calcification in trichinosed white rabbits, although given at various times in various doses (Wantland, 1935). In rats, however, von Brand *et al.* (1937, 1938) have shown that while no calcification is produced fourteen to seventeen days after infection by subcutaneous injections of parathormone, calcification may occur in two days in cysts four weeks to four months old after use of the hormone. Such calcification, however, does not proceed faster than calcification of other host tissues following injection of parathormone, and in fact intensive use of parathormone for this purpose usually results in death of the host. These authors conclude that any attempt to procure forced calcification with parathormone, irradiated ergosterol, or other agents is futile with the usual human doses, and dangerous if used in doses of a calcifying level; and they further state that calcification does not kill the larvae, but that the larvae themselves calcify after natural death.

Despite this warning concerning the use of the method, further work might show that it has therapeutic possibilities. Manifestly it cannot be used as a primary measure during the acute migratory stages, but any attempt to secure the host against possible toxic symptoms in the early encystment stage would seem to be a rational secondary treatment. Unfortunately experiments with laboratory animals on these lines cannot be taken as indicative of measures that could be applied to man, since different animals vary in their reactions to these substances, and the reactions of man himself must be studied.

The method actually has had a clinical trial in an outbreak of trichinosis. Hall (1937) treated his cases with calcium gluconate, and supplied vitamin D in the form of halibut-liver oil and viosterol; he reports that "the apparent effect of this therapy on the fever encourages us to believe that it may have brought about a shortening of the encystment stage." These results are encouraging, and a more extensive clinical trial should be made. Fantus (1935) has suggested that parathyroid extract be used, 20 to 40 units being given every twelve hours for not more than ten days, supplemented by a course of calcium lactate and lactose. Parathormone, for this purpose, has not yet had a clinical trial, but it would appear preferable to use ergosterol or some similar vitamin-D-containing substance as the calcification-induction agent, supplemented by a supply of calcium in the form of a bland organic salt, rather than parathormone, since the latter may produce a dangerous hypercalcaemia. It would seem advisable to begin any such course of treatment about the fourth week of the disease, when early encystment starts.

Recently Sogemeier (1938) has reported very favourably on another form of calcium therapy which appears to be of use during the acute migratory phases. Three cases were treated with three to seven intravenous injections of 5 c.cm. *gluco-calcium* (Lilly), given at the height of the febrile attacks, and these resulted in an almost immediate abatement of the pyrexia and the intestinal and muscular symptoms. Experimental trials of this method have not yet been made, though it is possible that such treatment is not lethal to Trichinella, but acts more in a detoxifying and perhaps nutritive and corrective manner: its effect during the acute stages suggests such a mode of action, and it is unlikely that it has any similarity to the calcium therapy outlined previously. A more extensive clinical and experimental trial of this method is urged.

Summary

The clinical and symptomatic treatment of trichinosis is briefly discussed and measures for the destruction of the parasite in the host are reviewed. Radium irradiation and catharsis appear to be of no practical value. The use of convalescent antiserum to control the toxic features of the disease should be tried if such serum could be made readily available.

Most chemotherapeutic measures involving the use of anthelmintics, antiseptics, disinfectants and related substances, organic arsenicals and similar substances, and certain miscellaneous drugs have been shown experimentally to be of no value and perhaps dangerous. There is experimental evidence, however, that the subcutaneous injection in olive oil or gum arabic of a suspension of the commercial thymol preparation carvasept or the oral administration of butolan (Bayer) (carbamic acid ester of *p*-oxy-diphenyl-methane) is lethal to a certain proportion of reproductive adults in rats, and their use results in a lessening in severity of the muscle invasion: a clinical trial of butolan should be made.

Excellent results have followed the intravenous administration of 5 c.cm. of gluco-calcium (Lilly) during the hitherto intractable acute migratory phase; this form of therapy should be given further clinical and experimental trials.

Experiments with rats, rabbits, and cats have shown that calcification after encystment may be considerably hastened by the administration of some vitamin-D-containing substance, supplemented by a supply of calcium in the form of a bland organic salt, thus protecting the host from toxic effects following encystment. Though a warning has been given that this treatment may result in a dangerous metastatic calcification of other organs, a further judicious clinical trial should be made. It should be noted, however, that this treatment is of no value before encystment of the larvae—that is, before four to five weeks have elapsed after infection.

REFERENCES

Africa, C., and Lucker, J. T. (1931). *Proc. Soc. exp. Biol.*, N.Y., **28**, 432.
Algora y Nieto, M. (1924). *Siglo méd.*, **73**, 160. Abstract in *J. Amer. med. Ass.*, 1924, **82**, 1232.
Anon. (1935). "Calcification Acceleration of Trichina Cysts." *N. Amer. Vet.*, **16** (3), 24.
Augustine, D. L., and Theiler, H. (1932). *Parasitology*, **24**, 60.
Bachman, G. W., and González, J. O. (1936). *Proc. Soc. exp. Biol.*, N.Y., **35**, 215.
Banerji, N. (1933). *Amer. J. med. Sci.*, **186**, 689.
Baudet, E. A. R. F. (1931). *Arch. Schiffs- u. Tropen-Hyg.*, **35**, 449.
—— (1935). *Tijdschr. Diergeneesk.*, **62**, 527.
Booth, B. A., Goerhing, W. N., and Kahn, M. (1916). *J. Amer. med. Ass.*, **67**, 2000.
Bugge, G. (1934). *Arch. wiss. prakt. Tierheilk.*, **68**, 24.
Caronia, G. (1937). *Arch. ital. Sci. med. colon.*, **18**, 283.
Chopra, R. N., and Chandler, A. C. (1928). *Anthelmintics and their Uses*, Baillière, Tindall and Cox, London.
Chükri, H. (1930). *Klin. Wschr.*, **9**, 298.
Clark, A. J. (1929). *Applied Pharmacology*, J. and A. Churchill, London.
Craig, C. F., and Faust, E. C. (1937). *Clinical Parasitology*, Henry Kimpton, London.
Culbertson, J. T., and Kaplan, S. S. (1937). *J. Parasit.*, **23**, 560.
—— —— (1938). *Parasitology*, **30**, 156.
Fantus, B. (1935). *J. Amer. med. Ass.*, **104**, 472.
Faust, E. C. (1929). *Proc. Soc. exp. Biol.*, N.Y., **26**, 748.
Ferenbaugh, T. L., Segal, L., and Schulze, H. A. (1938). *J. Amer. med. Ass.*, **110**, 1434.
Fleischmann, P. (1930). *Dtsch. med. Wschr.*, **56**, 648.
Greenwood, D. N. (1935). *J. Chemother.*, **12**, 232.
Grove, J. S. (1925). *J. Amer. med. Ass.*, **85**, 349.
Gruber, G. B. (1926). *Ergebn. Hyg. Bakt.*, **8**, 165.
Hall, A. (1937). *Ann. intern. Med.*, **10**, 1544.
Hall, M. C., and Wigdor, M. (1918). *Arch. intern. Med.*, **22**, 601.
Hardy, T. L. (1927). *Lancet*, **2**, 1380.
Hassin, G. B., and Diamond, I. B. (1926). *Arch. Neurol. Psychiat.*, Chicago, **15**, 34.
Herzberg, E., and Vitenson, I. (1930). *British Medical Journal*, **1**, 650.
Kahn, M. (1917). *N.Y. med. J.*, **105**, 1137.
McCoy, O. R. (1931). *Amer. J. Hyg.*, **14**, 484.
—— (1932). *Science*, **85**, 364.
—— (1935). *Amer. J. Hyg.*, **21**, 200.
—— (1938). *Proc. Soc. exp. Biol.*, N.Y., **38**, 461.
McDonald, E. P., and Waddell, K. C. (1929). *J. Amer. med. Ass.*, **92**, 449.
McNerthney, J. B., and McNerthney, W. B. (1916). Ibid., **67**, 1086.
Martin, L. D. (1936). *Med. Paises. calidos.*, **11**, 75.
Maternowska, L. (1933). *Zbl. Bakt.*, Abt. 1, Orig. **129** (3/4), 284.
Matoff, K. (1937). *Tierärztl. Rdsch.*, **43**, (21) 354, (22) 369.
Miller, J. J., jun., McCoy, O. R., and Bradford, W. L. (1932). *J. Amer. med. Ass.*, **98**, 1242.
Munk, F. (1917). *Med. Klinik*, **13**, 16, 161, 217.
Pierce, G. N., jun., and McNaught, J. B. (1937). *Proc. Soc. exp. Biol.*, N.Y., **36**, 579.
Ragany, J. (1935). *Med. Rec. N.Y.*, **142**, 335.
Roth, H. (1938). *J. Parasit.*, **24**, 225.
Salzer, B. F. (1916). *J. Amer. med. Ass.*, **67**, 579.
—— (1917). *Med. Rec. N.Y.*, **91**, 261.
Schulemann, W. (1920). *Dtsch. med. Wschr.*, **46**, 1050.
Schwartz, B. (1917). *J. Amer. med. Ass.*, **69**, 884.
Seifert, O. (1929). *Handbuch der pathogenen Mikroorganismen*, **6**, 995, Kolle and Wassermann.
Sogemeier, E. (1938). *Münch. med. Wschr.*, **85**, 669.
Spink, W. W. (1934). *Arch. intern. Med.*, **54**, 805.
Sprehn, C. (1931). *Tierärztl. Rdsch.*, **5**, 77.
Trawinski, A. (1935). *Zbl. Bakt.*, Abt. 1, Orig. **134** (3/4), 145.
Tyzzer, E. E., and Honiej, J. A. (1917). *J. Parasit.*, **3**, 43.
Van Cott, J. M., and Lintz, W. (1914). *J. Amer. med. Ass.*, **62**, 680.
van Someren, V. D. (1937). *British Medical Journal*, **2**, 1162.
—— (1938). In preparation.
von Brand, Th., Holtz, F., and Putschar, W. (1932). *Arch. exp. Path. Pharmak.*, **167**, 113.
—— —— and Vogel, H. (1933). *Z. Parasitenk.*, **6**, 308.
—— Otto, G. F., and Abrams, E. (1937). *J. Parasit.*, **23**, 533.
—— —— —— (1938). *Amer. J. Hyg.*, **27**, 461.
Wantland, W. W. (1934). *Proc. Soc. exp. Biol.*, N.Y., **32**, 438.
—— (1935). *J. Parasit.*, **21**, 441.
—— (1936). Ibid., **22**, 537, 538.
—— (1938). Ibid., **24**, 167.
Weltmann, O. (1931). *Med. Klinik*, **27**, 1600.
Wenderoth, A. E. P. (1917). *Inaug. Diss.*, Kiel.

BRONCHOSCOPY IN PULMONARY TUBERCULOSIS

BY

H. V. MORLOCK, *M.C.*, **M.D., M.R.C.P.**

Physician to the London Chest Hospital and to the Miller and Hampstead General Hospitals

AND

E. H. HUDSON, M.B., M.R.C.P.

Assistant Physician to the London Chest Hospital and to the West London Hospital

The value of bronchoscopy in the diagnosis and treatment of non-tuberculous diseases of the lungs is well established, but its use in tuberculous disease is still in the experimental stage. That this is so is due to the fear that such an investigation might do more harm than good to a phthisical patient. The same fear delayed the use of lipiodol investigation in these patients, but it has proved to be without foundation, and both these methods are now being employed freely in the investigation of the tuberculous patient.

Cases indicating Use of Bronchoscopy

It is not suggested that a diagnostic bronchoscopy should be a routine investigation in all cases; nevertheless, the recent recognition of tracheo-bronchial tuberculosis (a condition which can only be diagnosed by bronchoscopic vision) demonstrates that the more frequent use of this method is justified. We have endeavoured to employ it only in those cases in which consideration of the symptoms, physical signs, and a skiagram has led us to believe that it would definitely provide further useful information. These cases have fallen into the following groups: (1) sputum-negative cases; (2) those showing areas of collapse; (3) those showing areas of obstructive emphysema; (4) those with symptoms suggestive of tracheo-bronchial tuberculosis; (5) those in which another pulmonary disease is associated with pulmonary tuberculosis.

Sputum-negative Cases

It is not uncommon for a patient to present symptoms, physical signs, and a skiagram very suggestive of pulmonary tuberculosis, and yet the sputum and faeces are repeatedly negative for tubercle bacilli. In such cases bronchoscopic examination, swabbing of the bronchus, and examination of the swab and drained material for tubercle bacilli are often of considerable value.

This procedure has been carried out in twenty-one cases. In nine cases a positive swab was obtained and in nine a negative result. In the remaining three cases the swab was negative, but tubercle bacilli were found in the sputum raised the following day. Although some of the cases which gave a positive result had previously undergone the "laryngeal mirror test" with negative result, our series is at present too small for conclusions to be drawn as to the relative values of the two procedures. Now all cases have a "mirror test" before bronchoscopy, and further results may be of some value. It is interesting to note that, in seventy cases of haemoptysis without physical or radiological signs, a bronchoscopic swab taken at the time a diagnostic bronchoscopy was made has never once given a result positive to the tubercle bacillus.

Cases showing Areas of Collapse

Areas of collapse are more readily recognized than heretofore. Often the physical signs suggest the possibility of a collapsed area; nevertheless it is usually the skiagram which establishes the diagnosis of an area of collapse. As a rule the presence of collapse means the presence of bronchial obstruction, and when this is suspected it should be investigated by bronchoscopic examination to ascertain the nature of the obstruction. Whenever the skiagram of a tuberculous patient has shown an area of collapse we have investigated the case with the bronchoscope. Fifteen such cases have been investigated, and in twelve of them a definite obstruction to the main bronchus could be seen. In the remaining three no satisfactory cause for the collapse was visible. The twelve cases of obstruction fell into four groups:

1. Those in which the obstruction appears to be due to an enlarged gland or tuberculoma.
2. Those in which gelatinous tuberculous granulations obstruct the bronchus.
3. Those in which pulmonary fibrosis with resulting deformity of the bronchus caused the block.
4. Those in which the bronchial mucous membrane is so oedematous as to cause narrowing of the lumen, which is filled with tenacious secretion.

Group 1.—Of the glandular type we have had three examples, and in all cases we removed the gland piecemeal, with dramatic results as regards the collapsed area, this having re-expanded completely by the next day when a skiagram was taken. No patients have suffered harm as the result of this operation. Two of the cases occurred in children and were subsequently treated on sanatorium lines, with very good results. The other was an adult who, because of disease in the other lung, was given an artificial pneumothorax; this patient progressed satisfactorily.

Group 2.—The two cases in this group were particularly interesting. Both occurred in young adult males and were situated in the left upper lobe bronchus. One of these patients suffered from chronic tuberculosis of the right lung. He was attending as an out-patient for solganol injections. The collapse appeared insidiously and disappeared just as quietly. The other was an apparently healthy young man whose only complaint was cough, and whose skiagram revealed a collapsed left upper lobe. He is now at a sanatorium and responding quite well. In each case the gelatinous tissue had filled the opening of the upper lobe bronchus completely and lay absolutely flush with the surrounding mucous membrane of the bronchus, so that at first sight it appeared as though there was a congenital absence of the left upper lobe bronchus. However, closer examination revealed the gelatinous area. In both cases a piece of tissue taken for section proved to be tuberculous. Unfortunately, owing to the position it was impossible to remove it and relieve the obstruction.

Groups 3 and 4.—The third and fourth groups of collapse cases call for no special comment as their occurrence appeared to be the result of pulmonary disease, running its normal course, and no special treatment was indicated. There is, however, one point of interest: all these patients were over 40 and the presence of collapsed lobe raised the suspicion of a new growth.

Cases showing Areas of Obstructive Emphysema

In the same manner that the works of Chevalier Jackson have taught us to recognize that a collapsed area or lobe means bronchial obstruction, so the works of Coryllos have led us to suspect that a particularly large cavity, an emphysematous bulla, an emphysematous lobe, or even a totally emphysematous lung may be due to partial bronchial obstruction. The bronchoscopic investigation of such cases has been of interest, as the following four instances demonstrate.

In three patients the skiagram revealed apical cavities the size of an orange, but the symptoms were less than one usually associates with such apparently extensive lung destruction. Bronchoscopic examination showed that in two cases the opening of the upper lobe bronchus into the main bronchus was partially obstructed by greatly swollen and inflamed mucous membrane; in the third case there were large cavities at both apices, and by means of the retrograde telescope branches of both upper lobe bronchi were seen to be so distorted as to cause partial obstruction during expiration. The fourth case was the most interesting.

A girl of 20 with tuberculosis of the left lung was treated by an artificial pneumothorax. The lung collapsed well except for two adhesions in the mid-axillary region. Within the lower lobe of the collapsed lung there was a cavity the dimensions of a small hen's egg. In spite of increased pressures the cavity increased to the size of a large egg within a few weeks. We therefore cauterized the adhesions. Subsequent films, notwithstanding an increase in the collapse of the lung, showed a further enlargement of the cavity. Although no adhesion could be demonstrated by anteroposterior or lateral skiagrams, we thought that an adhesion might still be present, but on further thoracoscopic examination the lung was found to be entirely free. Skiagrams taken over the course of the next few weeks showed that in spite of a positive intrapleural pressure the cavity had reached the size of a small grapefruit. It seemed most probable, therefore, that we were dealing with an obstructive emphysematous cavity and that a bronchoscopic examination might prove it. On examination we found that at a point one and a half inches distal to the opening of the upper lobe bronchus the main bronchus was almost completely occluded by a bulge in the posterior wall. The problem then was, Should we attempt to complete the block and so cause collapse distal to the obstruction, or try to remove the partial obstruction and relieve the obstructive emphysema? As regards the first suggestion, the fear that permanent obstruction might produce suppuration distal to the obstruction was thought to be sufficient reason to abandon the idea. We have discussed the matter with Chevalier Jackson junior, and he expressed

the same misgivings. We therefore attempted to remove the obstruction by cauterization with the diathermy electrode, by the application of 20 per cent. silver nitrate, and by repeated dilatations with bougies. But we failed, and the cavity grew in size and the disease spread to the other lung, the patient dying some months later.

There is no doubt that the Brooks balloon, described since this case was under our care, will produce a successful temporary collapse, but as yet we have seen no reports of the late results. To deal with such cases as these, Mr. Shrantz of the Genito-Urinary Company has been trying to produce for us a reverse check valve, to be inserted in the lumen of the bronchus at the level of the obstruction, which will allow air to pass out during expiration but will prevent air entering during inspiration. So far, however, no suitable valve has been devised.

Tracheo-bronchial Tuberculosis

During the last few years there have appeared in the American literature several articles dealing with the condition known as tracheo-bronchial tuberculosis. In this condition there develops in the trachea or main bronchi a tuberculous lesion which may take one of the following forms: (1) a discrete ulcer, (2) a granulating ulcer, (3) a healed stenosis, (4) an unhealed stenosis, (5) a tuberculoma. One or more of these types may be found in the same patient. The condition usually exists with tuberculosis of the lung parenchyma, but may be the only tuberculous lesion present in a patient with a positive sputum and a negative skiagram. The condition is said to give rise to characteristic symptoms, and as the lesion is situated in the trachea or main bronchi these symptoms are, as would be expected, primarily those of bronchial obstruction—namely, a wheeziness suggestive of asthma, sometimes with physical signs localized over the bronchus affected; a degree of dyspnoea out of proportion to the physical or radiological signs of tuberculosis present; a paroxysmal cough, sometimes almost asphyxial; a marked irregular variation in the quantity of sputum, depending on the degree of obstruction present; a variation in the presence of tubercle bacilli in the sputum; the occurrence of a positive sputum or haemoptysis in a patient in whom the disease is apparently completely controlled by collapse therapy. Any of these symptoms, or a combination of them, should raise the suspicion of tracheo-bronchial tuberculosis, and should indicate a bronchoscopic examination.

Treatment.—As regards treatment of the condition it is obvious that owing to its position collapse therapy is of no help. The ulcerative type can be assisted by diathermy or the application of 20 per cent. silver nitrate. The healed stenosis can sometimes be overcome by dilatation with bougies. The unhealed type is best left alone. In the tuberculomatous type the obstruction can be removed either piecemeal or by diathermy.

ILLUSTRATIVE CASES

From the above description it will be recognized that a number of the cases described in the paragraph dealing with collapse are in fact examples or tracheo-bronchial tuberculosis. The cases described below are further examples.

A man aged 24, complaining of cough and wheezing, presented right apical signs, and a skiagram revealed a fibrotic condition with collapse of the right upper lobe. Bronchoscopic examination showed the opening of the right upper lobe to be partially occluded by a ring of calcified tissue, obviously a well-healed lesion of the stenotic type.

A girl of 21, complaining of dyspnoea, presented physical and radiological signs at the left base, the sputum being negative and the lipiodol examination showing slight bronchiectasis. Bronchoscopic examination disclosed an ulcerative stenosis in the left lower lobe bronchus. A piece removed for section showed tuberculous granulation tissue.

A young woman aged 23 who presented almost the same physical and radiological signs and bronchogram as the last patient was found on bronchoscopic examination to have a healed stenosis over the left lower lobe bronchus. At the time it was not recognized that this was tuberculous, and the patient was treated by postural drainage (as a case of bronchiectasis). She returned some months later with active tuberculosis throughout the left lung.

We have had one other identical case in a young man.

Cases Associated with another Pulmonary Disease

Occasionally when pulmonary tuberculosis is associated with other pulmonary disease a bronchoscopic examination may be of value in assessing the relative parts played by each disease in the production of the patient's condition.

A man aged 60 complained of cough and loss of weight with physical signs of collapse of the right upper lobe. The sputum was positive for the tubercle bacillus. The collapse at the age of 60 suggested the possibility of new growth. Bronchoscopic examination confirmed this. It is probable that the carcinoma had lighted up an old tuberculous lesion.

A young man aged 20 was admitted to hospital with high fever, cough, and signs at the right upper lobe. The sputum was positive to the tubercle bacillus and very offensive. Bronchoscopic examination suggested that the condition was primarily an abscess. The patient, not under our care, was first treated as suffering from tuberculosis. Necropsy showed an abscess cavity which had probably opened up an old tuberculous lesion.

Conclusion and Summary

Whether bronchoscopy be restricted to the indications we have mentioned or whether the indications be extended, we are of the opinion that it can yield valuable information in a number of cases of pulmonary tuberculosis, and that it is an investigation which is harmless and will in time be used more extensively.

A suggestion is made that diagnostic bronchoscopy might be more frequently used in certain cases of pulmonary tuberculosis.

The cases are divided into five groups, the signs and symptoms of which are reviewed.

Cases illustrative of some of the groups are given.

BIBLIOGRAPHY

Barnwell, J. B., Littig, J., and Culp, J. E. (1937). *Amer. Rev. Tuberc.*, **36**, 8.
Myerson, M. C. (1938). *Quart. Bull. Sea View Hosp.*, **3**, 227.
Samson, P. C. (1937). *J. thorac. Surg.*, **6**, 561.
Warren, W., Hammond, A. E., and Tuttle, W. M. (1938). *Amer. Rev. Tuberc.*, **37**, 315.

The Minister of Health on February 9 received a deputation from the Trades Union Congress, who submitted a memorandum on the inquiry into the continued increase of incapacitating illnesses of long duration, and urged that immediate steps should be taken to provide assistance for the general practitioner, linked with a method for compiling records so as to give a better picture of the incidence of occupational disease. The deputation stressed that the inquiry already set on foot was a limited one, and urged the collection of statistics over a wider field or, if necessary, the introduction of a new system of collecting such statistics. The Minister, in reply, said that he appreciated the points put forward by the deputation. He drew attention to the results which might be expected from the present survey, and hoped for the further co-operation of the Trades Union Congress in suggesting further fields of inquiry when the present one was completed.

TREATMENT OF DIPHTHERIA WITH REFINED ANTITOXIN

BY

ALEXANDER HUTCHISON, M.B., Ch.B., F.R.F.P.S.Glas., D.P.H.

Resident Assistant Physician, Belvidere Hospital, Glasgow

It has long been known that antitoxin is associated with a soluble globulin in the serum of immunized animals; many attempts have been made to concentrate serum and so reduce the volume of each dose—and, incidentally, troublesome serum sickness; for concentration, ammonium sulphate and sodium sulphate have been mostly employed.

From January to August, 1938, 200 diphtheria patients were treated in Belvidere Hospital with Burroughs Wellcome refined antitoxin prepared by Pope's (1938) process. This is antitoxin prepared by a process of enzyme disaggregation followed by differential heating; the antitoxin-containing molecule is much smaller than that in ordinary concentrated serum. The antitoxin was administered without desensitization of the patient, even though fifty of the 200 gave a history of previous injection of serum. No adrenaline was administered, but it was always at hand in case of emergency. Patients with cervical adenitis were given chewing-gum.

Diphtheria bacilli were obtained from 189 of the 200 patients, using McLeod's medium (Anderson *et al.*, 1931) in the first fifty cases, and Kerrin and Gaze's (1937) medium in the others. Sixty-three cultures were of the gravis type, fifty-two intermediate, and seventy-four mitis. Gravis and intermediate yielded a somewhat higher percentage of the more severe attacks than mitis, the five deaths all being due to gravis. Of the sixty-three gravis patients fifty-seven received serum before the fifth day, and forty-one were children under 10, the period in which the mortality rate is highest.

TABLE I

Method of Injection	No. of Patients	Antitoxin Units			Disappearance of Membrane, Discharges, or Glands (in hrs.)		
		Average	Max.	Min.	Average	Max.	Min.
Intramuscular ..	100	25,200	128,000	8,000	44	108	16
Intramuscular and intravenous	50	63,300	200,000	16,000	68	120	12
Intravenous ..	50	19,300	48,000	8,000	47	156	8

Reactions

Intramuscular Group (100 Patients).—No appreciable increase of temperature or pulse rate and no serum reactions or rashes occurred.

Intramuscular and Intravenous Group.—A slight reaction, with transient nausea and an increase of pulse rate by 10 beats and 2° F. rise of temperature, passing off in eight hours, occurred in an adult female who had some years previously received scarlet fever antitoxin. No serum rashes developed in this group.

Intravenous Group.—Two males, aged 16 and 18, with no history of previous injection of serum, showed definite immediate reactions. Both received 40,000 units. The elder patient felt faint, giddy, and sick, and had some difficulty in breathing, slight cyanosis, and an increase of 3° F. in temperature and of 30 beats per minute in pulse rate. The other showed a rise of 2° F., and his pulse increased by 20 beats per minute. Both patients were given 0.5 c.cm. of adrenaline hydrochloride intramuscularly, and they immediately recovered. No patient in this group developed a serum rash.

The following table gives some records of serum reactions.

TABLE II

	Serum Rashes	Pyrexia
Rolleston (1929)*	66.4	—
Metropolitan Asylums Board (1928)* ..	30.3	15.7
Metropolitan Asylums Board (1928)† ..	28.4	4.96
Hunt (1932)	28.1	—
Davis (1938)	17.3	—
Present Series..	0	1.5

* Whole. † Concentrated serum.

Complications

The figures in Table III indicate a definite reduction in the percentage of complications.

TABLE III

	Serum	Albuminuria	Paresis	Death Rate
Carter (1933) ..	Ordinary concentrated	71.8	33.7	24.8
Tannahill (1936)	"	96.5	53.5	9.5
Carter (1936) ..	"	5.0	24.0	8.0
Present series ..	"Refined"	6.5	11.0	2.5

General Notes

There were no reactions when the serum was given by the intramuscular route, and only slight reactions when it was given intravenously. There were five deaths, two occurring in patients who were moribund on admission and who died within a few hours; the other three were due to cardiac paralysis. The percentage of gravis bacilli in this present series (31) is very high compared with that of Carter in this same area (3.1 and 10.5 in different series), and this makes the 2.5 per cent. death rate a strikingly low figure.

Conclusions

Among 200 patients treated with refined diphtheria antitoxin (Pope) the death rate was only 2.5 per cent. No serum rashes were recorded, and immediate reactions after intravenous injection were few. The small bulk of the serum caused less discomfort to the patient than ordinary concentrated serum.

The percentage of gravis diphtheria in the Glasgow area seems to be on the upgrade.

Chewing-gum appears to be useful in adenitis, apparently causing massage of the cervical glands by the action of the jaw in chewing.

My thanks are due to Dr. Archibald, the medical superintendent of this hospital, for his permission to publish these results, and to Sister Rodger, the sister in charge of the wards, who has been more than kind.

REFERENCES

Anderson, J. S., Happold, F. C., McLeod, J. W., and Thomson, J. G. (1931). *J. Path. Bact.*, **34**, 667.
Carter, H. S. (1933). *J. Hyg.*, Camb., **33**, 542.
—— (1936). Ibid., **36**, 147.
Davis, H. M. (1938). *Lancet*, **1**, 193.
Hunt, L. W. (1932). *J. Amer. med. Ass.*, **99**, 909.
Kerrin, J. C., and Gaze, H. W. (1937). *J. Hyg.*, Camb., **37**, 280.
Metropolitan Asylums Board (1928). Report, London.
Pope, C. G. (1938). *Brit. J. exp. Path.*, **19**, 245.
Rolleston, J. D. (1929). *Acute Infectious Diseases*, London.
Tannahill, R. W. (1936). *J. Hyg.*, Camb., **36**, 140.

THE USE OF GAS-PROTECTIVE CLOTHING IN SINGAPORE

BY

Surgeon Commander E. R. SORLEY, M.D., D.P.H.

Principal Medical Officer, H.M. Naval Base, Singapore

In recent months much has been said and written about the menace of gas warfare. It is indeed a commonplace to say that protection against this product of "civilization" has become a vital matter to all the peoples of the globe. The science of gas attack and defence has been studied in considerable detail, and no problem has aroused more interest or discussion in Great Britain than the practicability of gas-protective clothing under the conditions of a modern war.

During the last year it seems that the most valuable contribution to the literature of the subject has been made by Major G. P. Crowden (1938), R.A.M.C., who instituted a series of tests in England, seeking to evolve a method which would make possible prolonged muscular effort in gas-protective clothing without the development of undue discomfort or danger to the wearer. He carried out three field tests, in which volunteers dressed in protective clothing performed strenuous muscular work for periods not exceeding forty-four minutes. Observations on body-temperature control and physiological reactions were made during and after the tests. An important object of Crowden's experiments was to ascertain to what extent bodily discomfort could be reduced by the wearing of a wetted layer of clothing closely adapted to the gas-impermeable layer of the protective suit. The materials which were used to form this external layer were flannelette, towelling, and khaki drill. Crowden also included in his tests an ordinary gas-protective suit (unwetted) and a gas-proof material faced with an outer fabric which could be periodically wetted.

As I have said, Crowden's experiments were conducted in England—in July, under average summer conditions. In presenting his conclusions, he claimed to have proved definitely the value of maintaining a wet outer surface on gas-protective clothing during the performance of heavy muscular work. His conclusions were:

"(*a*) The free evaporation of water which takes place from the wet outer surface of the protective garments increases body-heat loss provided the wet surface is in close apposition to the gas-impermeable layer of the protective clothing.

"(*b*) As a result of severe tests on a number of subjects working under conditions of temperature and humidity as high as are likely to be encountered in the English climate, it is concluded that if the outer surface of gas-protective clothing is maintained wet during the performance of muscular work, then the accumulation of body heat is prevented, sweating is much reduced, and the risk of heat collapse, even under hot summer conditions, eliminated.

"(*c*) In addition to indicating the general principles governing the effective use of artificial evaporative cooling, the tests carried out on various types of gas-protective clothing have established the following facts:

"(i) That an outer suit of wettable and wetted material, such as khaki drill, worn over Service protective oilskin clothing, enables muscular work to be carried out unimpeded and without discomfort under field-service conditions in summer weather.

"(ii) That gas-protective clothing of Service pattern but made up of gas-proof material faced with an outer wettable fabric layer periodically wetted is superior to the double garments described under (i) in facilitating the elimination of body heat.

"(iii) That a totally enclosing single-piece suit of gas-proof oilskin may be worn in safety provided an outer close-fitting single-piece suit and hood of wet fabric is also worn.

"(iv) That any one of the protective outfits described under (i), (ii), or (iii), when used as recommended, is notably superior to Service gas-protective clothing consisting of oilskin only."

Following the publication of Crowden's work, Lieutenant-Commander B. M. Douglas, R.N.(ret.), Passive Defence Officer, H.M. Naval Base, Singapore, invited me to co-operate with him in pursuing similar investigations in the climate of Singapore. We decided to perform two tests, using three subjects in each and choosing the days for performance of the tests as being typical of the Singapore climate—one day cloudy, the other unclouded. The clothing we chose for the tests was, first (Subject A), an ordinary gas-protective suit with hood and respirator; secondly (Subject B), a suit of wettable double cellular cotton with a hood of the same material and respirator worn over gas-protective clothing; and, thirdly (Subject C),

TEST 1.—*Performed on Saturday, August 13, 1938*

Meteorological conditions: sky cloudy; occasional sunshine; slight northerly breeze.
Dry-bulb temperature at start of test, 86°; wet-bulb temperature at start of test, 80°. Relative humidity, 77 per cent.
Dry-bulb temperature at finish of test, 87°; wet-bulb temperature at finish of test, 80°. Relative humidity, 73 per cent.

	SUBJECT A (Sick-berth Attendant Thomas, aged 30)	SUBJECT B (Leading Sick-berth Attendant Sanigar, aged 30)	SUBJECT C (Surgeon Commander Sorley, aged 36)
Clothing worn under protective clothing	Singlet, shorts, and socks	Singlet, shorts, and socks	Singlet, shorts, and socks
Observations before dressing in protective clothing	(*a*) General reactions: Feeling normal (*b*) Body temperature, 97.8° (*c*) Pulse rate, 78 (*d*) Blood pressure, 134/90 (*e*) Weight 12 st. 13 lb.	Feeling normal 97° 60 120/88 9 st. 8¼ lb.	Feeling normal 97.8° 64 132/90 12 st. 12½ lb.
Protective clothing worn ..	Ordinary anti-gas suit: oilskin jacket, trousers, gloves, hood; service respirator. Rubber sea boots worn under trousers	As for Subject A plus outer suit (jacket, trousers, and hood) of double cellular cotton	As for Subject A plus outer suit (jacket, trousers, and hood) of surgical lint
Time work started	11.42	11.42	11.42
Condition of clothing at start ..	Dry	Wetted all over: felt appreciably cooler	Wetted all over: felt appreciably cooler
Observations during work ..	Began shovelling at 22 per minute Wetted all over at 11.45 Felt cooler Rewetted 11.54: said he felt "like ice"	Began shovelling at 25 per minute Rewetted 11.47: cooler " 11.50: " " 11.54: "	Began shovelling at 32 per minute Rewetted 11.46: much cooler " 11.52: asked for rewetting " 12.5: asked for rewetting
Time work stopped	11.58 (then shovelling at 25 per minute)	11.58 (then shovelling at 18 per minute)	12.7 (then shovelling at 28 per minute)
Observations just after stoppage of work	(*a*) General reactions: Not fatigued. Perspiration +++. Shorts and singlet wet; socks damp. Hands "waterlogged" (*b*) Body temperature, 100.6° (*c*) Pulse rate, 140 (*d*) Blood pressure, 120/85 (*e*) Weight, 12 st. 11 lb.	Not fatigued. Perspiration ++. Shorts and singlet damp; socks dry. Hands "waterlogged" 100° 114 100/80 9 st. 6¼ lb.	Not fatigued. Perspiration +++. Shorts and singlet wet; socks dry. Hands "waterlogged" 99.6° 150 120/86 12 st. 10½ lb.
Summary of work done	Worked steadily for 16 minutes without rest, and nothing approaching serious fatigue resulted	Worked steadily for 16 minutes without rest, and showed no signs of serious fatigue	Worked steadily for 25 minutes without rest, and nothing approaching serious fatigue resulted

TEST 2.—*Performed on Friday, August 19, 1938*

Meteorological conditions: sun bright; sky clear; northerly breeze.
Dry-bulb temperature at start of test, 85°; wet-bulb temperature at start of test, 80°. Relative humidity, 79 per cent.
Dry-bulb temperature at finish of test, 90°; wet-bulb temperature at finish of test, 78°. Relative humidity, 57 per cent.

	SUBJECT A (Leading Sick-berth Attendant Scott, aged 28)	SUBJECT B (Sick-berth Petty Officer Williams, aged 36)	SUBJECT C (Sick-berth Attendant Thomson, aged 39)
Clothing worn under protective clothing	Singlet, shorts, and socks	Singlet, shorts, and socks	Singlet, shorts, and socks
Observations before dressing in protective clothing	(*a*) General reactions: Feeling normal (*b*) Body temperature, 98° (*c*) Pulse rate, 66 (*d*) Blood pressure, 125/80 (*e*) Weight, 9 st. 7 lb.	Feeling normal 97.8° 74 120/84 7 st. 7 lb.	Feeling normal 97.6° 62 130/85 9 st. 7½ lb.
Protective clothing worn ..	Ordinary anti-gas suit: oilskin jacket, trousers, gloves, hood; service respirator. Rubber sea boots worn under trousers	As for Subject A plus outer suit (jacket, trousers, and hood) of double cellular cotton	As for Subject A plus outer suit (jacket, trousers, and hood) of surgical lint
Time work started	11.10	11.10	11.10
Condition of protective clothing at start	Wetted all over: felt cooler	Wetted all over: felt cooler	Wetted all over: felt cooler
Observations during work and notes on stoppages	Began shovelling at steady rate Stopped 11.22: temperature 100.2°; pulse 140 Resumed 11.32 (rewetted) Rewetted 11.35 Stopped 11.38: temperature 100.6°; pulse 140 Resumed 11.47 (rewetted) Rewetted 11.52 Stopped 11.54: temperature 101.2°; pulse 100 Resumed 12.1 (rewetted) At 12.8 showed signs of flagging, but went on to finish at 12.10	Began shovelling at steady rate Rewetted 11.19 Stopped 11.22: temperature 99.4°; pulse 120 Resumed 11.30 (rewetted) Finished 11.33—said breathing was difficult (mask badly fitting and faulty)	Began shovelling at steady rate Stopped 11.16: temperature 98.6°; pulse 100 Resumed 11.22 (rewetted) Rewetted 11.35 Stopped 11.36: temperature 100.2°; pulse 140 Resumed 11.45 (rewetted) Rewetted 11.53 Stopped 11.56: temperature 101°; pulse 142 Resumed 12.8 (rewetted) Finished 12.14
Observations just after final stoppage of work	(*a*) General reactions: Rather tired, but not seriously fatigued. Perspiration +++. Shorts and singlet wet; socks dry. Hands "waterlogged" (*b*) Body temperature, 102° (*c*) Pulse rate, 152 (*d*) Blood pressure, 120/80 (*e*) Weight, 9 st. 6 lb.	Not at all tired, but held up by respiratory difficulty. Perspiration ++. Shorts and singlet wet; socks dry. Hands not "waterlogged" 99.8° 132 110/80 7 st. 5 lb.	Rather tired, but not seriously fatigued. Perspiration +++. Shorts, singlet, and socks wet. Hands "waterlogged" 101.2° 150 125/80 9 st. 5 lb.
Summary of work done	Worked for one hour, with three stoppages (26 minutes): 1st, 10 minutes' rest 2nd, 9 " " 3rd, 7 " " In all did 34 minutes' actual work	Worked for 23 minutes, with one stoppage (8 minutes) In all did 15 minutes' actual work	Worked for 1 hour and 3 minutes with three stoppages (27 minutes): 1st, 6 minutes' rest 2nd, 9 " " 3rd, 12 " " In all did 36 minutes' actual work

a suit of white surgical lint with a hood of the same material and respirator similarly worn over gas-protective clothing. We conceived the idea of the cellular and lint materials from the suggestions put forward by Crowden on the cooling power of the materials wetted and thus made closely adherent to the gas-impermeable layer of the oilskin suit.

So far as I am aware the use of gas-protective clothing in the Tropics has not yet been fully investigated; at least, no observations have been published. This article describes investigations into the practicability of such clothing for passive defence duties in the climate of Singapore, with special reference to body-temperature control and physiological reactions during and after the performance of strenuous muscular work. In Test 1 observations were made before and after the work; in Test 2 before, during, and after the work.

I have often heard it said that the use of gas-protective clothing in the Tropics is impossible for any useful period of time, such as would be necessary for decontamination duties in war, owing to the extreme discomfort and danger of heat exhaustion to the wearer. In the absence of any literature on the subject it seems that such statements have been made purely on assumption. It is my aim to attempt to prove or disprove this assumption and to determine whether it is possible to reduce discomfort or danger to personnel who may be called upon to perform passive defence work in Singapore.

Summary and Comments

It is interesting to make certain comparisons between the conditions obtaining in Crowden's tests and those observed in Singapore.

Type of Work Undertaken.—The work undertaken in Singapore was exactly as described by Crowden in his experiments—namely, the shovelling of sand with Service shovels, this effort being chosen to simulate closely the mixing of bleach and earth in the duties of decontamination.

Age and Physical Condition of Subjects.—The average age of Crowden's subjects was between 26 and 27, while that of the subjects in the tests described was between 33 and 34. It is impossible for me to deduce the physical condition of Crowden's workers, but presumably they were robust men, and to be regarded as average subjects. The Singapore workers can be looked upon physically as average members of a fighting Service personnel. They were recruited entirely from the medical department of H.M. Naval Base, Singapore.

Meteorological Conditions.—Here, of course, is an obvious and pertinent comparison. While Crowden's work was performed in the summer in England with wet-bulb and dry-bulb readings not rising above 68° and 62° respectively, the Singapore work was undertaken in tropical conditions.

Amount of Work Achieved.—Considering the comparisons between the air-temperature records and the age levels of the subjects in the two series of tests, I think it will be granted that the Singapore tests were calculated to try bodily endurance more severely than those performed in England. The best of Crowden's subjects produced forty-four minutes' continuous work without distress; the best results in the Singapore series were in Subject C in Test 1, who worked continuously for twenty-five minutes and showed no signs of fatigue; and in Subject C in Test 2, who performed over one hour's work with three stoppages amounting to twenty-seven minutes. It was unfortunate that, owing to a defect in his respirator causing respiratory embarrassment, Subject B in Test 2 was unable to continue beyond twenty-three minutes.

Physiological Reactions.—The highest body temperature after work recorded by Crowden was 100° ; in Singapore the highest was 102°. Both these records were shown by subjects who worked unaided by a wettable external layer to the protective suit. (A medical friend with whom I discussed the significance of the Singapore tests raised the objection that removal of the respirator during stoppages in Test 2—for the purpose of recording temperature and pulse—could not be permitted in war conditions, and so detracted from the value of the tests. I maintain, however, that the objection cannot be regarded seriously, since removal of the respirator—purely for recording purposes and unnecessary, therefore, in war conditions—could not aid to an appreciable extent the degree of heat elimination. Moreover, Lieutenant-Commander B. M. Douglas has suggested that, in war, situations might arise where—after the first or principal covering or removal of contamination had been achieved—it might be possible for the men who had performed this work to walk a short distance to windward and remove their respirators with safety.) The highest pulse rates recorded in the England and Singapore tests respectively were 180 and 160. A puzzling feature at first sight is the constant fall of blood pressure observed in all the subjects in Tests 1 and 2. After strenuous exercise, in the absence of circulatory collapse, one would anticipate a raised pressure. I can attempt to explain the phenomenon only by suggesting that the abrupt production of artificial pyrexia led to a pronounced vasodilatation. The loss of body weight is of little academic interest, being explained, of course, by fluid loss through profuse perspiration.

Personal Reactions.—Having taken the role of one of the workers (Subject C in Test 1), I feel entitled to record my reactions during and after the test. The discomfort I experienced had two main sources: first, the incessant pouring of sweat from my face into the respirator ; and, secondly (a feature which would have been produced irrespective of protective clothing), considerable aching in the muscles of the back due to the posture adopted in the act of shovelling. The other subjects confirmed these sensations. As for my physical condition at the end of twenty-five minutes' work, I can say truthfully that I was not seriously tired, although naturally uncomfortable. I felt I could have continued work for a further fifteen minutes at least without distress.

Conclusions

It seems that the assumption regarding the impracticability of gas-protective clothing in the Tropics, at any rate in the climate of Singapore, is unwarranted, because it is possible for men of average physical condition to carry out strenuous muscular effort in gas-protective clothing for the periods of time which would be necessary under war conditions without their undergoing serious danger of heat exhaustion. Much discomfort is inevitable, but in any case it is apparent that war-time and discomfort are necessary bedfellows. Even so, it is considered extremely unlikely that any man would be required to shovel continuously for as long as twenty-five minutes without a respite.

The continual wetting, during muscular efforts, of an ordinary gas-protective suit enables considerable work to be performed, diminishing discomfort and lessening the danger of heat exhaustion. Indeed, the standard and persistence of the work displayed by subjects who wore no external water-retaining layer scarcely fell below that shown by other workers who wore water-retaining material. It seems, then, that the ordinary gas-protective suit can be made practicable for use in the climate of Singapore, provided it is kept continually wet during use.

It has been possible to confirm only in part the findings of Crowden regarding the advantage of a wetted outer layer of material closely adapted to the gas-impermeable layer of the gas-protective suit. The imposition of a wetted outer layer certainly can achieve reduction of body temperature and discomfort, but not to an extent which renders essential the use of such a precautionary method. Wetted cellular cotton and surgical lint materials have some value as cooling agents when worn over protective clothing, but in this respect probably have no advantages over the wettable and water-retaining fabric adherent to the gas-impermeable layer, as described by Crowden. Cotton and lint in actual practice have these disadvantages: (*a*) their use necessitates increase of dressing and undressing times (highly important factors); (*b*) they would be apt to perish and shrink after boiling.

I have to acknowledge the co-operation of Lieutenant-Commander Douglas in the conception and conduct of the tests described above. I am also indebted in large measure to the sick-berth staff, H.M. Naval Base, Singapore, who, in the investigations, made of themselves willing victims, and whose enthusiasm for work remained undamped long after their persons and clothing could be so described.

REFERENCE

Crowden, G. P. (1938). *J. R.A.M.C.*, **70**, 217.

Clinical Memoranda

Metastasis in Gasserian Ganglion following Carcinoma of Breast

The metastases in the various organs recorded below must have been blood-borne and had probably left the primary growth before the operation was performed. In other words, it was the floating cell leaving the primary growth early by means of the blood stream which was the cause of failure of the operation, a process which is gradually becoming more and more recognized as the cause of failure in these early cases. The lymphatic spread probably was held up in the lymphatic glands.

A married woman aged 37 was admitted to St. Mary's Hospital on March 30, 1937, with a lump in her left axilla, which she had noticed for less than a week. Previously she had been quite healthy, and had had one child eleven years before, which she had nursed.

On examination a hard lump was felt in the left axilla, not tender, the size of a hazel nut, free from the skin and deeper structures. It was thought to be a gland. The breast was mastitic and indurated, but no lump could be made out. There is no record of transillumination. The other breast and glands appeared normal.

On April 2 a complete operation was performed ; three 3-mg. radium needles were placed in the axilla and three thrust down behind the clavicle. A dose of 1,368 mg.-hours was given. The pathological report stated: "Solid alveolar and trabecular polygonal-celled scirrhous carcinoma of the breast with metastases in the axillary glands. Mitotic figures were numerous." On October 18, 1937, she was readmitted for a radium plaque, and had 12,600 mg.-hours at 1 cm. distance over a local area. The skin desquamated.

In October, 1938, having been quite well in the interval, she consulted a physician for violent headaches, generalized in distribution, which had come on suddenly three weeks previously. They had continued without remission, and were associated with nausea, retching, and, finally, vomiting and running at the eyes. Both legs felt numb and she could not walk properly. Pain and numbness were present on the right side. There was loss of appetite. She had experienced mental disturbance, especially resentment of the presence of other people, and had failed repeatedly to recognize her husband. Up to the onset of these symptoms she had been able to do

her housework without difficulty. Examination showed the absence of knee-jerks and weakness in the right leg. The cranial nerves were normal.

On October 21 she was readmitted to hospital with intensified symptoms. She was drowsy and incapable of walking or giving a clear account of her symptoms. The headache was severe and she was delirious at night. Radiographs failed to reveal anything abnormal in the chest, spine, or skull. Two days later she developed palsy of the left sixth nerve. Dr. Brinton saw the patient and reported that she had rather highly coloured disks with indistinct margins and full veins; nystagmus on conjugate deviation of the eyes; complete palsy of the left sixth nerve; and incoordination of the movements of the limbs, more marked on the left side. The deep reflexes were absent. He thought there was a metastasis in the left posterior fossa.

The possibility of relief after a decompression operation and the subsequent application of a radium cap was discussed, but the neurologist did not recommend it. Morphine, 1/6 grain, and hyoscine, 1/200 grain, were given twice daily with relief. Sphincter control was retained, though at times she had difficulty with micturition. She remained in this state, the temperature only once rising to 101°, until November 4, when it rose sharply to 103° in the morning, falling to 101° at night. On the following day it rose to 105.6° and the pulse went up to 160, then becoming uncountable, and she died without regaining consciousness.

At the post-mortem examination no growth was found in the region of the old scar. Metastases were discovered in the glands on the left side of the neck, in the glands of the pancreas, and in the thymus gland. Nodules were also seen in the pericardium and in the second and fourth ribs on the left side. There was an ulcerated polyp in the stomach which on section proved to be innocent; a tabby-cat heart; oedema and congestion of the lungs and some hypostatic haemorrhage, but no bronchopneumonia; basal meningitis with fibrin and fluid pus on the meningeal surface of the brain, and a marked pressure cone. The brain was rather adherent on the right side near the internal auditory meatus, but nothing was found in the petrous bone or ear to account for this. There was no obvious growth in the brain, which was retained for section. Microscopy revealed a secondary carcinoma in the right Gasserian ganglion as the probable source of the meningitis. No growth was found anywhere else.

No sections were made of the bone in the region of the Gasserian ganglion, but a careful search was made and no sign of growth was found there or in the spot near the internal auditory meatus, where the brain was adherent.

Acknowledgment is due to Professor W. D. Newcomb and Dr. D. M. Pryce, who examined the original growth and performed the necropsy.

DUNCAN C. L. FITZWILLIAMS, Ch.M., F.R.C.S.
J. N. FELL, M.B., B.Ch.

The annual dinner of the Hospital Almoners' Association took place on February 11 at the Waldorf Hotel, London. Miss Warren, the chairman of the association, presided. The principal guest was Sir Arthur MacNalty, Chief Medical Officer to the Ministry of Health and Board of Education, who, in proposing the toast of the association, spoke of the value of the almoner's work in co-ordinating hospital and public health services. Miss P. Armstrong, almoner at the Royal Westminster Ophthalmic Hospital, responded. The toast of "The Guests" was proposed by Miss F. M. Brooks, almoner of Harrogate and District Hospital. Mr. E. C. Bligh, the Chief Officer of Public Assistance to the London County Council, replied on behalf of the guests, and emphasized the increase in the numbers of qualified almoners employed in municipal hospitals. Among the guests were Mr. Sutcliff Rhodes, Chairman of the Merseyside Hospitals' Council Contributory Scheme, and Professor K. Manheim, Lecturer on Sociology at the London School of Economics.

Reviews

KARL PEARSON

Karl Pearson. An Appreciation of Some Aspects of his Life and Work. By E. S. Pearson. (Pp. 170; 9 illustrations. 10s. 6d. net.) Cambridge: The University Press. 1938.

There are exceptions to the rule that near relatives are bad biographers. A. C. Benson's life of his father and Mrs. Creighton's life of her husband are among the best biographies we have. But neither author was a bishop or even a theologian. When a professor of statistics writes the life of one who was his teacher and predecessor as well as his father, doubts trouble us. Will the record be colourless or, in ultra-modern taste, daring and psychological? Professor Egon Pearson has happily resolved these doubts. His book is neither marmoreal nor unfilial. Anybody who reads it will be convinced that Karl Pearson towered above the common run of men in intelligence, energy, and vision, but was still a partaker of human frailties: sometimes mistaken, sometimes unjust, often passionate.

Professor Egon Pearson has written primarily for statisticians and biometricians, but has been most skilful in making technicalities clear. Thus on pages 101–2 a difference of points of view which is important and has been the cause of much bad blood is admirably elucidated. The portraits illustrating the text should interest psychologists. Like Archbishop Benson, Karl Pearson grew handsomer as the years passed. The young man of 33 seems to have little in common with the man of 67. In both there is a certain intensity, a touch of grimness, in the eyes. But one is a pugnacious, self-confident youth; the other might be a doge or a great bishop of the fifteenth century. The pugnacity has mellowed into placid strength. It was the same with his character. In earlier days light was more evident than sweetness. He never, indeed, underwent the metamorphosis of Florence Nightingale—to the end he could be very fierce indeed—but to those who only knew him in his last years Karl Pearson's reputation for ferocity seemed mythical.

The physical likeness to a mediaeval statesman or bishop which we fancy we can see in his portrait reflected a spiritual element upon which Mr. Udny Yule commented and Professor Egon Pearson's documentation brings out. Karl Pearson was fundamentally a religious man; his earliest writings were directly or indirectly concerned with ethical notions. Scientific work became for him, emotionally, a religion. Hence differences of scientific opinion became for him what matters of faith were to a Father of the Church—errors to be purged with fire. The columns of this *Journal* have borne witness to the zeal. Collectively and individually (in the persons of many of our leaders) the profession has felt the weight of *Malleus Haereticorum*.

But that was almost a generation ago; to-day we should all agree with Osler and rank Karl Pearson among our benefactors. He raised our standard of accuracy; he gave us instruments of research which all might and many did use. His medical collaborators were not drawn only from the ranks of those who were professionally interested in statistical methods. Among his most valued associates were Edward Nettleship and William Bulloch. He could and did encourage fine work, whether on hereditary disease, skin pigmentation, or anything else human, which did not contain the most distant reference either to

coefficients of correlation or to probable errors. His knowledge of some branches of medical literature would have staggered even the Censors of the Royal College of Physicians. Yet the medical sciences were but a fraction of his interests. Philosophy, history, mathematics, in each subject he did enough to keep his name from oblivion; as bio-statistician he dwarfed his contemporaries; it was Eclipse first, the rest nowhere. He was a reversion to the polymaths of the sixteenth and seventeenth centuries, the Scaligers and Casaubons. As in their work, so in his, errors have been found. In the time to come, just as now there are fine scholars who have never read a line of Scaliger or Casaubon in the original texts and fine physicians without first-hand knowledge of Hippocrates or Galen, there will be great biometricians and statisticians who have never read one of Karl Pearson's papers. But the names of Scaliger, Casaubon, Hippocrates, Galen, and Pearson will always be honoured. It will always be felt —vaguely, perhaps, but indubitably—that they stand for something of fundamental importance in the intellectual history of man.

Those who knew and loved not Karl Pearson but "K. P." are fond enough to wish that a memory of the man himself may at least survive our generation, and we are therefore grateful to Professor Egon Pearson.

M. G.

APPLIED ANATOMY

Applied Anatomy: Functional and Topographical. By Robert H. Miller, M.D. (Pp. 484; 55 engravings, 16 coloured plates. 30s. net.) London: Henry Kimpton. 1938.

In this most interesting and informative book Dr. Robert H. Miller, associate professor of anatomy in the College of Medicine at Memphis, University of Tennessee, deals with anatomy from the physiological and morphological aspects as well as from the applied and purely anatomical standpoints. The opening chapter on the skin, which he describes as "the greatest and most ancient sense-organ in the animal body," is especially worthy of note, and embraces much matter quoted from various recent articles and books on histology, physiology, and comparative anatomy. The book as a whole deals with anatomy from the regional point of view, various items being discussed from the surgical aspect; the author, however, does not attempt to give a complete account of those minute details of anatomical relationships a knowledge of which is essential for carrying out particular operations, and which are best described in textbooks on operative surgery. Some of the illustrations are new, and are faithful representations of original dissections, but many, such as those from Gray's *Anatomy*, are already familiar to most students of anatomy. Unfortunately, although most of these are excellent, two are open to adverse criticism: Plate VII, a diagram which represents the "subcutaneous tissue" of the scalp two or three times its normal depth, and Figure 42, from an old edition of the above-mentioned work, which represents the intercostal nerve lying between the internal and the external intercostal muscles, whereas the main nerve lies in the space between the intracostal muscle and the internal intercostal muscle, in the same morphological plane as the nerves in the abdominal wall—namely, between the transverse abdominal muscle and the internal oblique. In Figure 2 there are also some obviously accidental mistakes with regard to the lines indicating the metacarpal bones and the first and second phalanges. The illustrations as a whole are, however, excellent and in keeping with the high standard of the text. The book forms a valuable addition to the literature on applied anatomy.

PSYCHOTHERAPEUTIC METHODS

Psychological Methods of Healing: An Introduction to Psychotherapy. By William Brown, D.M., D.Sc., F.R.C.P. (Pp. 224. 7s. 6d. net.) London: University of London Press. 1938.

Dr. William Brown has produced another book on psychotherapy, but in spite of the interest of many of the chapters it is disappointing. To a great extent it is a collection of lectures and papers written by the author for various bodies on various occasions, some demanding a popular disquisition, others a scientific treatise. The result is a scrappy, disjointed presentation, with much repetition of the author's well-known views which have been set out in his previous works. Dr. Brown has often declared his opinions on the value of hypnosis for restoring lost memories, especially with emotional intensity. He has often told us how useful suggestion is, especially in the waking state, and insisted that mental analysis is not enough, since the patient requires help in a resynthesis of his attitude towards life. He has often criticized the teaching of Freud, Jung, and Adler, and claimed that he has built up a system of psychotherapy of his own by a judicious choice of the cream of the teaching of all three, while retaining a just conception of spiritual non-temporal values as opposed to material temporal considerations. Many would agree with him that such an eclectic system would represent the ideal form of psychotherapeutic theory and practice, but they are still awaiting from Dr. Brown a clear, concise, and consecutive exposition of this theory and practice. Perhaps, however, that is asking too much, and the time may not be ripe for such a presentation either by Dr. Brown or by anyone else, and it is only fair to say that this book makes no attempt at it. While regretting, therefore, that this is not the book for which we are looking from the pen of Dr. Brown, we may commend to the reader of medico-psychological literature an interesting and well-written series of lectures on psychotherapeutic methods.

FRACTURES AND DISLOCATIONS

Experience in the Management of Fractures and Dislocations. By the staff of the Fracture Service, Massachusetts General Hospital, Boston. Under the General Editorship of Philip D. Wilson, M.D. (Pp. 1,036; 1,419 illustrations. 65s. net.) London: J. B. Lippincott. 1938.

The Treatment of Fractures. By Charles Locke Scudder, Ph.D., M.D., F.A.C.S. Eleventh edition. (Pp. 1,208; 1,717 figures. Frontispiece. 55s. net.) London: W. B. Saunders. 1938.

During the past fifty years the treatment of fractures has passed through a series of remarkable stages, and in spite of the great progress made it has not yet reached finality. Fifty years ago the recognized method was prolonged fixation in irksome splints, and this was only too frequently followed by permanent disability. To-day it is axiomatic that active use of the limb begins at the earliest possible moment and that splints are used as a means of support and not of restraint. The old method of treatment was well summed up in the surgical dictum—fix the joints above and below the fracture. In the case of an elderly woman with a fracture of the thigh this meant that she was tied to a long Liston splint from the foot to the axilla for two months, so that even if she survived she was permanently crippled with a fixed hip and knee. To-day it is by no means uncommon for a patient with a fractured ankle to walk out of the casualty department in which he has been treated.

If the treatment of fractures has improved, with the pressure of modern life their number has enormously increased. In this country the total number of fracture

cases exceeds 200,000 a year, and for a very large proportion of these road accidents are responsible. It is not too much to say that the handling of these cases is a problem of national importance, and in fact a Government Committee which has devoted more than two years to its consideration is about to issue its report. It is, therefore, with pleasure that we welcome the appearance of two volumes devoted to these accidents, both fully worthy of their subject and representing a high level of surgical achievement. They are very different in character and in aim, and we venture to express the opinion that no one who wishes to make an extensive study of the subject can afford to be without both volumes.

The Management of Fractures and Dislocations, under the general editorship of Dr. Philip D. Wilson, represents the experience of the staff of the Fracture Service of the Massachusetts General Hospital, Boston, and to it have contributed all the twenty-three members of that staff. It is a study of just under 4,000 patients treated at that hospital between the years 1923 and 1930. Of 1,573 graver cases treated in the hospital wards, over 75 per cent. have been followed to a conclusion, while every case has been followed up with scrupulous care. We have much sympathy with the statement of the authors that "in general much more can be learnt from the bad results than the good, and we have taken pains to report them fully." To carry out such an idea in practice demands a high degree of altruism, but it is precisely this spirit which inspires the whole of the work recorded and which gives it a unique value. The volume is divided into sections dealing with fractures and dislocations in particular regions. They are all arranged on the same plan, beginning with the study of regional anatomy, passing on to general considerations, discussing the treatment of simpler cases and complications, and finally giving the end-results. At the end of each section are given in detail the whole of the cases upon which the section itself is based, and each individual case is illustrated by outline sketches showing precisely the injury received. Taking at random the chapter on the upper end of the humerus, this opens with an accurate anatomical description of the region, and then discusses the mechanism of these fractures and their statistical distribution. Fractures of the surgical neck are discussed in some detail, and this is followed by fractures of the great tuberosity, fracture-dislocation, and separation of the epiphysis. In each of these items special difficulties of treatment are indicated and the means by which they may be overcome, and in each statistical summaries are given of the results which may be expected. Certain conclusions are drawn of the greatest practical value expressed with point and brevity, and there follows, by far the most important part of the section, an accurate description of each of the 105 cases upon which this section has been based. It is, however, impossible in a short account to give any real idea of the vast amount of material this volume contains. Every fracture and dislocation throughout the body has been studied in the most minute detail, and the whole of this immensely complex mass of material has been presented with a clarity which is beyond praise. It is a magnificent tribute, not only to American surgery but to a resource and collaboration which we in this country would do well to imitate.

In *The Treatment of Fractures* (Scudder) we have the eleventh edition of a standard work which has stood the test of time. It covers the whole subject of fractures from every possible standpoint, and is indeed a tribute to the vast experience of the author. That the production of the book is of the highest possible order goes without saying, but this merely furnishes the setting for a mass of accurate detail, the value of which to practical surgery cannot be overestimated. Although, perhaps, many surgeons familiar with modern methods would scarcely agree with the views expressed regarding the ambulatory treatment of fractures and the non-operative treatment of fractures of the patella, these are small matters and do not in any way detract from the immense value of this great record of practical experience.

BLOOD GROUPS

Les Groupes Sanguins. Leur Application à la Biologie, à la Médecine et au Droit. By Professor Ludwik Hirszfeld. Translated from the Polish by Dr. Hanna Hirszfeld. (Pp. 169; 15 figures. 30 fr.) Paris: Masson et Cie. 1938.

This synopsis of current knowledge of the blood groups is one of a handy little series with a yellow cover known as *Médecine et Chirurgie: Recherches et Applications.* Professor Hirszfeld, one of the pioneers of the study of blood differentiation, has written for biologists, medical men, and lawyers, to save them the impossible task of digesting the thousands of works on inheritable blood characters, and to give them the principal data and an account of the problems which remain to be solved. He has arranged his chapters more or less in the historical order of the various discoveries connected with the blood groups, and his last chapter summarizes the theory, which he has put forward with Kostuch, that the relation between A_1 and A_2 in a population is the expression of causes which influence serological mutation in the direction of A and away from the starting-point O. He suggests that these mutations did not take place suddenly but gradually, and are in fact still taking place. He has developed a classification of bloods into "isozeric pleiads"—that is, categories distinguished by the possession of given amounts of the residual character O. It is yet unknown whether the incidence of the pleiads is the same in different parts of the world. The reader who has hitherto been repelled by the apparent complication of blood-group literature will find here a concise and well-expressed guide through its perplexities, written by one who has been a leading figure long enough to have become impartial.

Notes on Books

Manual of Massage and Movements, by EDITH M. PROSSER, is published at 12s. 6d. by Faber and Faber. Although this is not intended for the medical profession but rather as a textbook for massage students, it can be read with interest and instruction by any medical man who wishes to dictate the details of treatment to a masseuse. The technique and application of the various manipulations used in massage are briefly and accurately expounded. Two-thirds of the book are devoted to exercises, every one illustrated by matchstick drawings, the work of Miss M. Ruddick, and the clarity of the directions and the illustrations could not be bettered. Miss Prosser's book should have a future. One has the feeling that with its aid it would be possible to become a masseuse by taking a correspondence course.

An *Anatomical Atlas for Nurses and Students*, edited by Dr. IAN M. BURDON and Miss S. MACDONALD, and published by Faber and Faber at 5s., is illustrated by A. K. Maxwell, whose skill as an anatomical artist is so well known that there is no necessity to do more than mention his name in recommending this publication as being an excellent pictorial aid to anatomy. The illustrations are supplemented by a short descriptive text and notes on special systems, such as the digestive and endocrine.

Part 2 of Volume XVI of *Tabulae Biologicae* (Hague: Dr. W. Junk, 35 florins for each volume of four parts; 30 florins for subscribers) contains a number of articles of general biological interest. The chief article of special medical interest is one on the electro-encephalogram by Dr. H. Davis of Harvard. The author makes a tentative classification of the types of curve composing the normal human adult electro-encephalogram and describes six varieties. The frequency of these types varies from about 1 per second to 1 per 30 m.sec. The article contains a number of illustrations of the various types of electrical response which occur in normal subjects, and concludes with a special article on the electro-encephalogram in epileptic seizures.

Social Service in the Clinic for Venereal Disease, by DOROTHY MANCHÉE, is published by Baillière, Tindall and Cox at 3s. Everybody knows what happens when an "irresistible force meets an immovable body," but everybody does *not* know what to do when an insoluble problem crops up in hospital. The answer is, "Go to the lady almoner." Those who do not believe this should read what Miss Manchée has written. The two great bugbears of the venereal diseases clinic are the defaulters and the patients "in trouble"; a good lady almoner will keep down the numbers of the former and prove a friend in need to the latter. All who have to do with the administration of a V.D. clinic should not only study this excellent little book but keep it by them for reference.

Causes of Crime, by ARTHUR E. FINK (Oxford University Press, 14s.), is a survey of biological theories on crime in the United States between 1800 and 1915. The author felt that there existed no systematic presentation of American thought in this field, and that the writers of the countless American textbooks on American criminology had consistently failed to indicate their awareness of the necessary groundwork which had been laid by American physicians, prison administrators, and other students of human behaviour. On research he found an astonishing variety and quantity of work on the causal factors in human behaviour, and he concluded that social historians had failed to probe into and interpret the nature and extent of these accomplishments. He begins with Benjamin Rush and continues his study through the long line of those American physicians who wrote on human relationships down to William Healy, who developed the concept of the essentially dynamic character of the human personality. The material is presented from the biological, anthropological, and psychological points of view to show that Healy's book, *The Individual Delinquent*, marked the transition from the old to the modern era. He concludes that criminal behaviour indicates a difference of degree and not of kind, and that the criminal is not a composite of traits which when added together become a criminal, but rather a functioning integrated personality. The book contains a large bibliography.

The *Proceedings* of the German Society for the Investigation of the Circulation (eleventh meeting) contain a number of interesting papers. Half the papers deal with the difficult subject of shock or circulatory collapse. A perusal of this section impresses the reader with the large amount of work that has been directed towards the elucidation of this important problem, and also unfortunately with the small amount of agreement that has been attained. A general review of the present state of knowledge (Gollwitzer-Meier) shows that the tangle of toxic factors, nervous factors, and chloride and water loss is still unravelled. A paper by Ellinger on the effects of poisons such as allyl formate on capillary permeability is noteworthy. It is interesting to note that much attention is now being paid in Germany to the use in collapse of synthetic sympathomimetic compounds such as veritol, and several papers deal with the results obtained by this form of therapy. *Verhandlungen der deutschen Gesellschaft für Kreislaufforschung* are published at Dresden by Theodor Steinkopff (RM. 11.25).

Zur Erblichkeitsfrage des endemischen Kretinismus, Part I, by J. EUGSTER, is a reprint from the Archives of Julius Klaus-Institute for Research in Diseases of Heredity, Social Anthropology, and Race Hygiene, Volume XIII, No. 3. It is published at Zürich by Dr. O. Schlaginhaufen at the Anthropological Institute of the University, Sempersteig 3. Examination of 204 cretins led to the definite conclusion that cretinism is not a genuine hereditary disease. That numerous cretins are children of healthy parents would not be an important argument, because recessive heredity might be taken into account. However, there are better proofs against the hereditary character of the disease: (1) only children are sometimes healthy although both their parents are suffering from the disease; (2) the gravity of the disease varies geographically according to the intensity of the goitre endemism; (3) no cretin was found who had been born in a district free from endemic goitre. Moreover, a recessive disposition could be excluded because consanguinity of the parents was not found in a higher percentage than in the remaining population.

Preparations and Appliances

SYNTHETIC OESTROGENS

We have received from British Drug Houses Ltd. and from Boots Pure Drug Co. Ltd. preparations of the synthetic oestrogenic product stilboestrol (stilboestrol B.D.H. and stilboestrol Boots). The Crookes Laboratories also are marketing a preparation of the same chemical, under the name neo-oestranol I.

Stilboestrol (4:4'-dihydroxy-$\alpha\beta$-diethylstilbene) is a synthetic product which has an oestrogenic activity similar to that of oestrone, but the compound has a relatively simple structure which bears little apparent relation to that of the naturally occurring sex hormones. Recent reports in this *Journal* of clinical trials indicate that stilboestrol is effective on administration by mouth and when thus administered produces all the therapeutic actions of the natural oestrogenic hormone. The oral dose of drug recommended is less than 5 mg. per diem, and 1 mg. three times a day is suggested as a suitable dose in many conditions. Stilboestrol therapy occasionally causes nausea and vomiting, but the reason for this is not clear. The indications for oestrogenic therapy are numerous, and are in process of exploration. The introduction of the new synthetic product should do much to promote advance in this important subject.

EUPAVERIN

Eupaverin Merck is a synthetic compound introduced in 1930. Its chemical name is methylene-dioxy-benzyl-methyl-methylene-dioxy-isoquinoline. The drug was introduced as an antispasmodic, for its action resembles that of papaverine, although its toxicity is less. Eupaverin has recently been found to possess a powerful vasodilator action. This property has been utilized for the conservative treatment of embolism, and several favourable clinical reports on this subject have appeared in German periodicals in recent years. Cases not only of arterial embolism but also of pulmonary embolism have been effectively treated with eupaverin.

PLACENTAL GLOBULINS FOR MEASLES

Placental globulins (human) B.D.H. is a preparation for the modification, prevention, and treatment of measles. The makers state that injection of the preparation produces immunity to infection for about two weeks, and when given during the incubation period attenuates the disease and reduces the incidence. The preparation promises to be very serviceable for reducing the trouble caused by the occurrence of measles in families and in institutions.

BAKER AND KOCH CANCER TREATMENT IN NEW ZEALAND

[FROM OUR CORRESPONDENT IN WELLINGTON]

The following is the report of an investigation into alleged cancer cures which has been sent to the Minister of Health for the information of the New Zealand Government. The report is the work of a committee consisting of Sir James Elliott, M.D. (chairman), Mr. H. Hardwick-Smith, F.R.C.S., Dr. J. O. Mercer, and Dr. T. R. Ritchie.

As you are aware, a medical committee was set up—we understand at the request of Dr. Ulric Williams and his colleagues Professor Brose and Mr. McCulloch—to investigate an alleged cancer cure to be tried at Wanganui, and strongly recommended to the notice of the Government by these gentlemen. The Investigation Committee which was accepted by Dr. Ulric Williams consisted of Sir James Elliott (chairman), president of the New Zealand Branch of the British Empire Cancer Campaign; Mr. H. Hardwick-Smith, F.R.C.S.; Dr. J. O. Mercer, M.R.C.P., pathologist, Wellington Hospital; Dr. T. R. Ritchie, director of the Division of Public Hygiene, Department of Health. The setting up of this committee was contained in your memorandum dated August 22, 1938.

The members of the Investigation Committee approached this inquiry with an open mind and the desire that some efficacy might be disclosed in these cures, even although one part of the treatment—namely, by Koch's fluid—had been investigated at various times in America during the past twenty years.

For the purpose of the investigation the committee proceeded to Wanganui on August 31, 1938, and carefully examined fifteen patients under treatment by Mr. McCulloch under the supervision of Dr. Ulric Williams. Professor Brose was, so he informed us, chiefly interested in this method of treatment as he was anxious to test in these cases a method which he had devised for testing the blood of patients to find if they had cancer or not, and if so the progress of this disease. It is right to say that this test approved by Professor Brose is not generally accepted.

Of the fifteen cases the committee, after investigation, decided that six of the patients had cancer and six were probably cancerous, but in the absence of confirmatory evidence the diagnosis at that time was open, and the remaining three cases were very definitely not cases of cancer. Of the six probable cases two were subsequently proved to be cancer by pathological examination. All the patients that we saw on this occasion had already been treated, so that we were given no opportunity of actually seeing the treatment given or of examining the fluids which had been used for the treatment.

We were especially interested in four breast cases which had been treated by local injections of fluid round the periphery of the breast ten days prior to our visit, and we understand that they had also been given an intravenous injection on August 30. The results as we saw them on August 31 were as follows. In each case the whole of the breast and a varying but extensive surrounding area was completely gangrenous, black, and malodorous. All these patients had undergone the diet treatment previously. No temperature charts or case reports were available, but the Investigation Committee was able to get in some cases reports and records from hospitals and medical practitioners in other parts of New Zealand where these patients had received advice or treatment. This was done with the knowledge and consent of Dr. Williams.

Condition of Patients after a Fortnight

The Investigation Committee was invited to see these four breast cases again on September 14 because, we were informed, Professor Brose and Mr. McCulloch were leaving for Australia and were desirous that we should see the improvement that had taken place in the condition of these patients. We then definitely learned that the treatment given was the injection of Baker's fluid locally in the breast cases and also, in addition, intravenous injection of Koch's fluid in all cases. Mr. McCulloch gave the committee the impression that Baker's fluid (in the breast cases) destroyed only and exclusively and selectively all cancerous tissue, and that Koch's fluid searched out all cancer cells throughout the body wherever they might be and destroyed them.

In the opinion of the members of the committee the general condition of the patients showed no improvement. Two of the four cases were markedly worse. In all cases the gangrenous breasts had sloughed away together with surrounding tissue, extending in one instance from the centre of the breastbone to the posterior margin of the armpit and exposing a large raw area of breast muscle. In one case healing had already begun to take place from the margins of the raw area. The other patients had shown no sign of healing at that early stage and would require a considerable period for the healing of the large areas. There was a great amount of mutilation. In three of the four breast cases the diagnosis of cancer was confirmed microscopically by an examination of the separated breast tissue.

It proved that this second visit of investigation on September 14 was also to be our last. Quite unexpectedly Dr. Ulric Williams sent word that our investigations were to cease. You will remember, Sir, your efforts to induce Dr. Ulric Williams to reconsider this decision. He declined to do so. His last communication on the subject, under date December 16, states:

"Since both Baker and Koch have written to me in the strongest terms declining to submit their products to test in their absence I have no alternative to breaking up negotiations with your committee."

The committee, although thwarted in its investigation in this way, has seen reports of investigations made into both the Baker and Koch treatment in the United States of America under more favourable conditions, and these reports have been very condemnatory of the treatment.

Some Conclusions of the Committee

As a result of our observations and study of the cases seen at Wanganui we can make certain conclusions. We have no doubt that Baker's fluid is a powerful sclerotic agent and can cause great local destruction. Compared with surgical treatment destruction by a sclerosing or caustic fluid seems like a reversal to the treatment in the Middle Ages, causing unnecessary mental distress, delayed healing, and increased risk of septic infection. We have had no evidence whatever to show that Baker's fluid has any selective powers in the destruction of cancer cells. There is no real difficulty in removing the breast surgically or by crude destruction, but this is very far from a cure of the breast cancer and may delude the public mind. The danger of death from cancer of the breast lies in the great tendency of breast cancer, if not treated early and by substantiated methods, to spread to the armpit, inside the chest, or into the bones, or elsewhere.

From our general knowledge and from the observations we were permitted to make in investigating the cases at Wanganui we have no reason whatever to suppose that Koch's fluid has any effect in curing generalized cancer.

All the evidence available, without exception, convinces your committee that the claim cannot be substantiated that the treatment which we saw practised at Wanganui has any merit as a cure or palliative for cancer. This claim that a cure has been found for cancer should never be made and promulgated until prolonged tests have shown that the claim is a reasonable one. . . .

Your committee considers that it is in the public interest that a statement should be made that our hope of finding anything useful in the treatment recommended by Dr. Williams and his colleagues has proved illusory.

BRITISH MEDICAL JOURNAL

LONDON

SATURDAY FEBRUARY 25 1939

A CHANGING MEDICAL WORLD

An address, published elsewhere in this issue, by Dr. Walter Elliot, Minister of Health, is a very good example of the reaction of the trained medical mind to the expressed desire of the people for more organization in medicine. It is to seek out and evaluate the forces which have brought the practice of medicine, and especially of preventive medicine, to its present stage of development, and to identify what is essential and worthy of preservation in a medical world that has changed and will go on changing. In his summing-up the Minister reminded his hearers that "life and death are the raw materials of the State, and those dealing with life and death must always and inevitably be under some compulsory connexion with the State, call it organization or what you will, both in peace and in war." At the outset he had remarked on the highly individualistic character of the medical profession, and later said, "With all the general practitioner's statutory duties to the State and his work in the public health services he has remained an individualist. It seems desirable that he should continue to do so." How are these two principles to be reconciled? There may be practitioners who do not accept the first; some people certainly disbelieve in the other, whether in medicine or any other walk of life. Generally speaking the profession appreciates its statutory responsibilities and asks only that the best side of its individualism should not be destroyed by the growth of State medicine, and, above all, that the relations between doctor and patient should keep that "something of a religious character" which Dr. Elliot recognizes. The opposition between the need for organizing modern medicine, bringing to persons of all economic levels the costly benefits of prophylactic and curative science, and the paralysis of initiative by regimentation, is not easily sidestepped. The British Medical Association, in its Proposals for a Medical Service for the Nation, has tried to find a way which is in the direct line of the evolution of our public health services as traced by the Minister in his address. There may be other means, but it is at least satisfactory to find that the principles enunciated in that document are not different from those expressed by Dr. Elliot. If the approach to such a service must be gradual, we may well be content with the prospect that these principles will be observed at each step, under the present Minister of Health.

In the history of public movements for the betterment of health nothing is more interesting than the irregular play of medical and non-medical personalities on the problems of their times. This is well revealed in Dr. Elliot's account. Progress in the nineteenth century would have been impossible without the scientific work of brilliant observers like Snow, Simon, and Farr, and their predecessors, Lind, Jenner, Mead, Pringle, and others too numerous to mention. The venue of Dr. Elliot's address also calls to mind names from the less remote past, like Gairdner, Russell, and Brownlee. But it would be equally true to say that that progress was largely due to the efforts of a few zealous laymen—for example, Edwin Chadwick on sanitation; Michael Sadler, Lord Shaftesbury, and Robert Owen on health in industry. Public health law, factory law, and the Poor Law, as they emerged from the hands of these pioneers, show how British legislation adapts itself to the practical exigencies of the circumstances in which it governs. Health in industry is preserved through a central organization with specialized officers acting for the whole country, as well as regional and district officials directly responsible to the centre. The Poor Law is administered by local authorities whose every act may theoretically be dictated or questioned by a Government Department, acting through central and regional officials. Public health is essentially the province of local authorities, the Minister's powers of supervision being mostly of a general character, except for the raising of loans and the administration of services still earning *ad hoc* grants. In this field there may, for that reason, have been less uniformity of achievement, but there has also been less bumbledom. As Dr. Elliot points out, a large proportion of the early medical officers of health were part-time, but the need for effective organization is speeding up their replacement by whole-time officers responsible for bigger areas. This movement is one which has the approval of the British Medical Association, and there is yet no sign that it has been accompanied by any bureaucratic tendencies. Indeed, a medical training is a safeguard against any such tendency, and the understanding between health departments and the rest of the profession has never been better than it is to-day. The conditions are therefore favourable for the still closer association which the plans for a general medical service entail. Co-operation

locally, however, between the profession and the authorities has not reached the same degree of freedom and regularity as that fostered centrally by the Minister and his Department. Perhaps because the new public health is more personal and less environmental—a field for specialists—laymen with broad vision seem to be less in evidence than they were a hundred years ago. In the difficult fusion of public health and domiciliary medicine there is need for a cross-infection of lay and medical minds, which can only be attained by planned contact, of a kind not quite the same as that between elected employer and paid official. Certain movements toward regionalism may afford the opportunity.

As we learned from Dr. Elliot on another recent occasion,[1] the Ministry is partly regionalizing its medical inspectorate, not merely for purposes arising from a war emergency. The plans for hospital provision and for first-aid and ambulance services in an emergency overflow the boundaries of local government. The immediate requirements will bring the profession, through local emergency committees, into close collaboration with the Ministry's hospital and regional officers, the local health departments, and the boards of management of the local hospitals. This machinery, we hope, may never be needed for its immediate purpose, but lessons of co-operation should be learned from it. It is clear at least that the present Minister of Health is well equipped to apply the experience gained from war preparations to the more wholesome pursuits of peace.

A BIOLOGIST ON POPULATION

The University of London has been fortunate in its choice of Heath Clark lecturers. A few weeks ago[2] we noticed Professor William Bulloch's masterly sketch of the history of bacteriology; Professor Bulloch's successor in the lectureship, Professor Raymond Pearl, chose for his subject the "Natural History of Population," and his course is published in book form.[3] Population is very much in the air just now, and only this week a pamphlet, "Population and Fertility," has appeared, to which we shall refer in the near future. The literature of the subject is so great that the novelty of a book must be chiefly in the point of view rather than in the factual information conveyed. Actually Professor Pearl does provide a good deal of new information; he is the first writer to give quantitative precision to many vague ideas. On the relation between sexual activity and reproduction, the limits of the potentially fertile span, the appropriate statistical measures of reproductivity, the real effect of contraceptive efforts, and many other subjects, he gives new and properly analysed data. This is not to say that predecessors have not made exact contributions to several of these subjects—contributions noted by Professor Pearl—but that he has collected many more data and set all the available information in proper perspective. Yet it remains true that it is the writer's attitude rather than his new data which gives the book a freshness to seek in most treatises on the subject. Professor Pearl's point of view is that of a biologist, and he never departs from it. Most of us can talk biologically about ovulation and fertilization in general, can still be reasonably biological when we discuss the size of family of human beings, but when we reach the problem of world population—past, present, and future—we are a little apt to falter and become partisans of this or that economic or political doctrine. That is not Professor Pearl's way.

> "It is one of the commonest of assertions that the faults and troubles connected with the 'distribution' of goods are chiefly to blame for the world's woes, with the implication that if these faults could be eliminated the world's economic troubles would largely disappear. But, faults or no faults, the present geographical arrangement of world population makes it plain that *without* substantial 'distribution' of the means of subsistence from the places where they are produced to the places where they are used, something over a half of all human beings could not go on living at all. Somebody *must* haul to these city-dwelling near-termites with only two legs, much too large heads, and no exoskeleton, all that they eat, all that they wear, and everything that protects their soft bodies from the rigours of the physical environment. Furthermore, this transport must never cease."

This skewed distribution of density is inveterate. Before the world war Italy had planted only 8,000 people in her African colonies, Germany 24,000 in all her oversea possessions. In India fewer than 10 per cent. of the population is living outside the district of birth. Further, at the present time nine nations having 23 per cent. of the world's population and occupying 14 per cent. of its area control 66 per cent. of all the land in the world. Such figures as these, Professor Pearl remarks, breed wars; and, biologically speaking, wars contribute nothing to the solution of the world problem, or rather make it more difficult of solution because of the extravagantly wasteful destruction of real wealth war always causes. The present position has come about through man's power to alter the balance of nature in a direction immediately advantageous to him, with the result that there has been in the last two hundred years an enormous growth

[1] *British Medical Journal*, 1939, **1**, 335.
[2] Ibid., 221.
[3] *The Natural History of Population*. By Raymond Pearl. Oxford University Press. (10s. 6d.)

of population entirely disproportionate in magnitude and rapidity.

"So, on the whole, man's only chance of coming successfully through the ghastly mess he is plainly in for would seem to lie, for what it may prove to be worth when put to the supreme test, in the fact that he has shown himself in the past to possess somewhat greater innate powers of adaptability than any other organism ever known."

As we are used to demonstrations of the national danger of "race suicide" it is good that a biologist should call our attention to the more general problem. Professor H. L. Hawkins, quoted with approval by Professor Pearl, gave the grim warning that the position of man as a species to-day presents a remarkable similarity to that displayed by many others in the palaeontological record just before their disappearance from the cosmic scheme of things. The argument runs thus: The population of the world is now so strangely distributed that only an extremely delicate and complex machinery can keep a large proportion of it alive. In the past civilizations have risen and fallen, but they were but small affairs—even the Roman Empire itself. A residue of more primitive, nearer-to-earth people remained. This is ceasing to be true. The collapse of civilized peoples may be the end of Man. Probably Macaulay's New Zealander will never survey the ruins of London from a broken arch of London Bridge. But perhaps some Martian of the epoch will reflect that at the time these biological facts were obvious the ablest men of at least four nations were spending much of their time in working out plans to exploit the peculiar densities of population so that the maximum destruction of human life might mutually be secured. He will rightly conclude that Man deserved to become extinct.

PROPHYLAXIS OF PNEUMONIA

Only those in the habit of reading the American literature can have any conception of the magnitude of the effort being made in the United States to reduce the mortality from pneumonia. Almost every advance in the production and therapeutic application of serum has been owing to it, and, indeed, since the original definition of its three main types the pneumococcus has been almost the prerogative of American workers. More enterprising even in a way than efforts to improve serum treatment, because at first sight so impracticable a task to bring to any convincing conclusion, has been the attempt to evaluate a method of active immunization against pneumonia. The enterprise which will even contemplate so formidable a task as this must command admiration, and the assumption on which it is based that people will avail themselves of a means of averting so comparatively remote a risk as an attack of pneumonia also indicates the far greater enthusiasm for prophylactic inoculation which exists in the United States as compared with the general attitude to such proceedings in this country. Clearly the value of a method of active immunization against pneumonia can only be proved by employing it in many thousands of cases with adequate controls, all of whom remain under observation for some time afterwards. Opportunities for such clinical experiments presented themselves in the large American camps established for the unemployed, and the first results observed were reported by Lloyd Felton himself, who has been a pioneer in this work as in the preparation of therapeutic serum, to the Section of Pathology and Bacteriology at the Annual Meeting of the British Medical Association in 1936. This work has been continued and expanded yearly since, and during the field tests of 1936–7 the observations made covered a total of 70,856 men, of whom 29,234 were inoculated. In a full description of this study by Felton and his co-workers which has now appeared[1] the immunizing procedure is discussed and the results in this group of men are analysed. The antigen used is an extract containing the type-specific polysaccharide of pneumococci of Types I and II: a comparatively small dose of this material elicits a marked degree of immunity, as indicated by protection tests with the serum of an inoculated individual in mice, and the usual procedure has been to give a single injection of 2 mg. The results in the two groups of camps where it was employed are expressed in a form taking into account the period during which each man remained under observation; they were 4.34 and 1.73 pneumonia cases respectively per 1,000 years of life in the inoculated and 7.28 and 15.69 in the corresponding controls. Analysis of the results in different age groups suggests that immunization is chiefly effective before the age of 25; the duration of immunity is unknown, and an effect on mortality in cases of pneumonia occurring among the inoculated cannot yet be deduced. A generally promising result from this prodigious study has thus to be qualified in several ways which leave a useful practical outcome in some doubt. Although it is proposed to continue this work, it may well be questioned whether the incentive to it will persist if chemotherapy in pneumonia proves as successful in the United States as it already has in this country. Another report of purely academic interest, but having wider bearings, is that of W. F. Goebel,[2] who claims to have produced immunity to pneumococcus infection with an artificial antigen. This attempt was approached through a study of the chemical constitution of bacterial polysaccharides, and the antigen used was obtained by combining the diazonium derivative of the *p*-aminobenzylglucoside of cellobiuronic acid with horse serum globulin. It was shown by several methods that injection of this substance produces antibodies to Type III pneumococci, and an antiserum to it also conferred protection against Types II and VIII. It need scarcely be said that anyone who can dig deeply enough into the chemistry of immunity phenomena may ultimately make a discovery of profound consequence.

[1] *Publ. Hlth. Rep. Wash.*, 1938, **53**, 1855.
[2] *Nature*, 1939, **143**, 77.

HUMAN RABIES IN SOUTH AFRICA

Investigations described in the last annual report of the South African Institute for Medical Research, Johannesburg, include continued work upon the problem of pneumonia affecting native miners on the Witwatersrand and elsewhere; extensive testing of samples of Kaffir beer to estimate possible anti-scorbutic properties; and the isolation of the organism *Listerella monocytogenes* from rodents suspected of plague infection. It appears that there must have been an extensive epizootic among veld rodents of the disease caused by this organism—listerellosis or Tiger River disease. Interesting points arose in the study of three cases of human rabies. A child of 10, bitten by a meercat in the right hand, died four weeks later. By microscopical examination, when Negri bodies were seen, and by biological tests, the brain gave a positive result for rabies infection. The virus, however, proved to be absent from the cerebrospinal fluid. In the second case an adult European male who had handled a calf "that died in a strange manner" succumbed to rabies. One hemisphere of his brain was sent to the laboratory for examination, immersed not in glycerin in the usual way but in strong formalin solution; the other hemisphere had been inadvertently destroyed. It was feared that the formalinized brain would be unsuitable for the inoculation tests in animals. This did not prove to be the case. The animals died with the signs characteristic of rabies infection, and Negri bodies were demonstrated both in their brains and in the original formalinized specimen. In the third case an exceptionally long incubation period was revealed: a native child died of rabies ten months after being bitten by a wild-cat. The usual period of incubation in human beings in South Africa is almost invariably between four and six weeks.

ANTISEPSIS IN THE OPERATING THEATRE

We commented[1] some time ago on a study made in the U.S.A. of the aerial flora in operating theatres, culminating in the construction of a lamp emitting rays designed to sterilize the air over and around the operating table. Cultural tests showed that this apparatus was efficient. There is now clinical evidence of its usefulness in a report by Hart[2] on the results of 132 thoracoplasty operations performed "in a field of air sterilized by means of bactericidal radiant energy." This operation, owing mainly to its length and the large area of tissue exposed, is peculiarly liable to be followed by sepsis. In the author's previous experience this sepsis was usually staphylococcal, and his cultural studies of operating theatre air showed the frequent presence of virulent *Staphylococcus aureus*, which was assumed to be derived from the throats of the theatre staff. Hart now reports that the use of bactericidal light has halved the mortality of this operation and reduced post-operative infection to one-tenth of its former frequency. In a few cases where infection nevertheless occurred it was attributed to contamination of the wound by sweat. That light which is tolerable in other respects can be sufficiently bactericidal for this purpose is an important observation, and other hospitals which can afford what is doubtless an expensive installation—the exact construction and nature of which are not specified—will doubtless wish to give this method a trial. This paper does not discuss the chemical antiseptic technique used, or the possibility of preventing or at least minimizing aerial contamination by more efficient masks. We noted before that there seemed to be some mystery about the dangerous contamination of air with bacteria presumed to come from the throats of the staff even when silence was observed, and it still seems as though investigation on other lines might point to a simpler form of precaution. The cost of modern surgical apparatus is mounting steeply, and to declare the necessity for any purpose of a new and elaborate safeguard is to assume a serious responsibility.

[1] *British Medical Journal*, 1937, **2**, 709.
[2] *J. thorac. Surg.*, 1938, **7**, 525.

PREGNANCY AND PHTHISIS

What is the true incidence of pulmonary tuberculosis in pregnancy, and what is the precise influence of the former upon the course of the latter? This question may seem rather superfluous in the light of the mass of statistical and clinical evidence that has been brought forward in the past few years, but study of the very considerable literature on the subject reveals a surprising amount of disagreement on what would appear at first sight to be a fairly easily settled point. One of the reasons for this disagreement is probably that the great majority of reported statistics have emanated from various tuberculosis sanatoria, for though it is obvious that most cases will be concentrated in these hospitals it is equally natural that this very concentration will lead to a certain amount of bias, however involuntary. It is, indeed, surprising to find that, in spite of the large series of cases reported from various sanatoria, the incidence of pulmonary tuberculosis encountered in ordinary obstetric practice is so very small. Tisdall[1] in a study of 19,634 consecutive cases in a Brooklyn hospital found only fifteen suffering with the disease, an incidence of 1 in 1,309, and this in spite of the fact that a moderate estimate places 15 per cent. as the incidence among the general "healthy" population of the United States. It must, of course, be remembered that in many cases the disease is latent, a fact which has recently been strikingly substantiated by the work of Eiseile and Mason,[2] who found forty-three cases of unsuspected phthisis by routine roentgenological examination of 4,000 apparently normal pregnant women—an incidence of 1.06 per cent. With regard to the effect of pregnancy on pulmonary tuberculosis, the early workers believe that it had a favourable influence. Later the opposite view held the field (Cohen,[3] Greenhill[4]), but more recently Castlen[5] and others have

[1] *Amer. J. Obstet. Gynec.*, 1938, **36**, 472.
[2] Ibid., 387.
[3] *British Medical Journal*, 1936, **2**, 751.
[4] *Year Book Obstet. and Gynec.*, Chicago, 1936.
[5] *Amer. Rev. Tuberc.*, 1936, **34**, 340.

shown that providing the woman is properly treated the risk is no greater. In view of this uncertainty among physicians the work of Tisdall is illuminating. He found that in 66 per cent. of his cases the onset of tuberculous symptoms began after pregnancy occurred, and that in over 50 per cent. the tuberculous process was not discovered until the onset of labour. In addition, most of the patients died within three months of delivery. The conclusions which may be drawn from this work are that pregnancy has a definitely deleterious effect on active cases, particularly when the disease developed after pregnancy had occurred; that all apparently normal cases should receive most careful ante-natal examination to determine the possibility of incipient phthisis; and that when the disease is established the patient should be given all the advantages of sanatorium treatment under the combined care of obstetrician and physician. Most authorities believe that pregnancy should be interrupted in these cases, but in view of the greatly improved prognosis under modern treatment it is doubtful whether this should really be applied with the constancy almost automatically recommended, particularly in those mild cases in which the desire for a living child is an important consideration.

DIRECT OBSERVATION OF GASTRIC ULCERS

Gastroscopic control of the course and healing of gastric ulcers is now carried out frequently enough to enable accurate comparisons to be made with other methods of examination, particularly radiography. Dr. Schindler, whose work with the flexible gastroscope has done so much to advance this method of diagnosis, has lately reported with others the results of gastroscopic, clinical, and radiological study of fourteen cases of gastric ulcer.[1] In this study certain well-recognized difficulties in the understanding of the natural history of ulcer are again emphasized: the remarkable way, for instance, in which symptoms may come and go even though an ulcer crater is by direct observation apparently quite unchanged; the fact, so well appreciated by now, that disappearance of an ulcer niche in an *x*-ray examination does not necessarily mean complete healing. What has perhaps been less definitely demonstrated is that the peptic ulcer process begins in the mucosa and penetrates into the submucosa and muscularis, and not vice versa, as has been the view of many observers since the days of Virchow. It is indeed still widely held that the initial lesion is a vascular one in the deeper layers of the stomach which leads to a necrosis and digestion of the necrotic tissue by the gastric juice. Schindler's observations show that small ulcers may increase in size, and that acute ulcers may appear rapidly and heal completely without any symptoms whatever. Further healing and recurrence of ulcers were observed at approximately the same site, as well as the occurrence of fresh ulcers on different parts of the mucosa. In general terms the conclusion these workers suggest is that ulcer formation is the result of an erosive rather than an infarctive process, and that chronic ulcer develops from an acute ulcer—a view which many will probably contest. The rate of healing in the cases observed varied greatly: in some complete epithelization of an ulcer took place in a little over a month; in others it was not complete at the end of one or more years. It was noted that very slow healing was present in those patients whose gastric emptying time was slow, and that overwork, worry, fatigue, concurrent infection, and failure to carry out treatment all had a deleterious effect upon the rate of healing. Under favourable conditions, however, healing proceeded to such complete restitution that the scar of the ulcer became scarcely visible gastroscopically. Such controlled studies give further valuable support to the view emphasized by Schindler and his colleagues that gastric ulcer must be regarded as a penetrative process beginning in the mucosa and invading the deeper layers; this being so, it follows that causes and factors associated with gastritis must be of importance in the pathogenesis of ulcer and its treatment.

[1] *Amer. J. digest. Dis.*, 1938, **5**, 504.

JAMES CANTLIE

The recent biography of Sir James Cantlie[1] is a fascinating record of the adventurous career of a many-sided and attractive man, an ardent Scot, an enthusiast, and an inspiring pioneer. One of the eleven children of a farmer in Aberdeenshire, who lived not far from the birthplace of Sir Patrick Manson, with whom he had much to do later on, he was educated at the University of Aberdeen and there met his senior and life-long friend Mitchell Bruce, who induced him to become a medical student at Charing Cross Hospital, where he was first demonstrator of anatomy and then elected to the surgical staff. An old photograph shows him with a full beard sitting in the middle of five other frock-coated but nearly clean-shaven colleagues. With persuasive energy he promoted the establishment of the Volunteer Medical Staff Corps in London; his private practice suffered, and in 1886 he left London to become Manson's successor in practice at Hong Kong, where, full of energy, he taught the Chinese the art of medicine, and founded a public library, a hospital, and a debating society. He investigated plague, leprosy, and tropical diseases so extensively that he looked forward to bringing out a textbook on tropical diseases, but gave it up when Manson's book had appeared. Cantlie's health, after nearly nine years, was considerably affected, and in 1896 he returned to London and soon became so busy as an authority on tropical medicine that he was obliged to decline his former colleagues' suggestion that he should again be surgeon to Charing Cross Hospital, where, however, he became lecturer on applied anatomy. With "irrepressible energy" he threw himself into all kinds of activities; warmly welcomed by Manson, they worked together for the School of Tropical Medicine; he founded in 1898 the *Journal of Tropical Medicine and Hygiene*, most of which he wrote. In 1896 he was the means of rescuing his friend Sun Yat Sen from imprisonment in the Chinese

[1] *Sir James Cantlie. A Romance in Medicine.* By Neil Cantlie and George Seaver. John Murray. 10s. 6d.

Legation. There is much more to tell, but perhaps no more need be said, except that Sir Arthur Keith has written a most charming and full introduction, to make readers feel that this is a book to read.

THE FOUNDER OF THE N.S.P.C.C.

The centenary of the birth of Benjamin Waugh, the founder of the National Society for the Prevention of Cruelty to Children, fell on February 20, and is celebrated by a special number of *The Child's Guardian*, the organ of the society. In a memoir recounting the life-story of this brave crusader for the rights of children many details are given of the origin of the organization, first known as the "London" Society, in 1884, following upon the foundation of an earlier local society in Liverpool by Mr. Frederick Agnew, who brought the idea from across the Atlantic. A reproduction of the invitation card to the meeting at the Mansion House to form the society includes such famous names in nineteenth century philanthropy as Shaftesbury, Aberdeen, Burdett Coutts, Kinnaird, and Barnardo. From the first Waugh was the moving spirit, and he was managing director of the society for twenty years, until his retirement in 1905, three years before his death. It is usual to refer to the Children Act, 1908, as the "children's charter," but the memoir points out that the way for this was prepared by the Prevention of Cruelty to Children Act, 1889, and the amending Act of 1904, both of which were due to Waugh's persistency in bringing before the Home Office the necessity for their main provisions. The need for this pioneer work half a century ago can perhaps be faintly imagined when it is said that even now the society has to deal in a year with 120,000 neglected or otherwise ill-treated children.

SOCIAL OPHTHALMOLOGY

The second number of the *Journal of Social Ophthalmology* has been issued from 66, Boulevard Saint-Michel, Paris. Like the first number, the articles published therein are printed in parallel columns in French and English. Apart from a few notices relating to the work of the International Association for the Prevention of Blindness, and an account of the initiation of the Ophthalmological Society of Australia by the British Medical Association, the whole forty pages are devoted to the sight of children, and for the most part to sight-saving classes for children with defective vision. There is an admirable introduction by Dr. Park Lewis of the United States; then four papers on sight-saving classes. Mr. Bishop Harman, who originated these classes in London in 1908, writes a brief but comprehensive account of the principles governing them. He begins with a pregnant sentence: "Every school ought to be a sight-saving school; if it is not it falls short of the proper standard of a school." Professor Martin Bartels deals in detail with the working of these classes in Germany. Besides showing how advantageous they are to the children, he proves from the experience of the city of Dortmund that they secure a great saving of educational costs as compared with schools for the blind to which many of the defective children would otherwise need to be admitted. Mrs. Winifred Hathaway records that there are now in the U.S.A. no fewer than 571 such classes. Their great difficulty is the diversity of opinion among ophthalmologists regarding myopia. In one State myopes are sent to the schools, in another they are held to be ineligible. A conference of ophthalmologists at Chicago has drawn up a plan of guidance. Lastly Dr. René Odic writes on the work of the classes in Paris. Dr. P. Baillart, the president of the association, has an article on the "Normal Child," in which he deals with lighting in schools; and Professor van Duyse contributes a note on school medical inspection in Belgium. This issue of the *Journal of Social Ophthalmology* should be read by every school doctor.

DR. HUTCHISON'S PORTRAIT

Last autumn a letter was published over distinguished names intimating that friends of Dr. Robert Hutchison were proposing to open a fund to present Dr. Hutchison with his portrait in acknowledgment of his contribution to medicine and upon his election to the Presidency of the Royal College of Physicians of London. The announcement was enthusiastically welcomed, and success was assured when Mr. James Gunn accepted the commission to paint the portrait. The painting is a tribute to both artist and subject, and we feel sure it will be a source of delight and satisfaction to Dr. Hutchison and his friends. The presentation will be made by Lord Macmillan on Wednesday, March 1, at 5.30 p.m., at the Royal Society of Medicine, by kind permission of the council. In response to requests photographic reproductions are being made available.*

We regret to announce the death of Mr. Graham Simpson, F.R.C.S., late professor of surgery in the University of Sheffield, and for the past ten years a member of the Council of the Royal College of Surgeons of England.

We are asked to state that the fifth biennial Informal Conference organized by the British Empire Cancer Campaign will be held on Tuesday and Wednesday, March 14 and 15, at the Royal Society of Medicine. Admission is by card only, after application to Mr. W. H. Ogilvie or Dr. R. W. Scarff, joint honorary secretaries of the Organizing Committee (British Empire Cancer Campaign), 11, Grosvenor Crescent, London, S.W.1.

On Tuesday, March 14, and Thursday, March 16, at 5 p.m., Professor W. W. D. Thomson will deliver the Lumleian Lectures on "Primary Carcinoma of the Lung" before the Royal College of Physicians of London, Pall Mall East, S.W.

* Photographic copies (9 in. by 11 in.), mounted, may be obtained from P. Laib, 3, Thistle Grove, London, S.W.10. (Price 5s. 6d., postage extra.)

SURGICAL PROCEDURES IN GENERAL PRACTICE

This is one of a series of articles contributed by invitation

HAEMORRHOIDS

BY

C. NAUNTON MORGAN, M.B., F.R.C.S.

It is still common, unfortunately, to find that the term "haemorrhoid" is used to include quite a number of pathological conditions in the ano-rectal region, thus leading to confusion both in diagnosis and in treatment. Brief consideration of the types of haemorrhoids, their anatomical sites, symptoms, and diagnosis, is therefore essential before adequate treatment can be instituted. There are two distinct types—internal haemorrhoids and external haemorrhoids, arising from the internal and external haemorrhoidal plexuses respectively.

External Haemorrhoids

The external and internal haemorrhoidal plexuses communicate freely, so that an external haemorrhoid may be associated with a corresponding internal haemorrhoid and may in advanced cases form with it a composite pile—an intero-external haemorrhoid. The external haemorrhoidal plexus is covered by sensitive anal skin; any infection or thrombosis of this plexus will therefore give rise to pain. External haemorrhoids present two main types:

1. A thrombosed external haemorrhoid which may be associated with infection and thrombosis in the internal haemorrhoidal plexus or spontaneous thrombosis in the external haemorrhoidal plexus unassociated with internal haemorrhoids. The former will be considered later when dealing with internal haemorrhoids; the latter is termed an "anal haematoma."
2. Hypertrophied anal skin tags. These may result from congestion due to enlargement of the external haemorrhoidal plexus associated with internal haemorrhoids. Oedema and hypertrophy due to infection from trauma and scratching also produce these skin tags, apart from the presence of internal haemorrhoids.

Anal Haematoma

Spontaneous rupture and thrombosis of a portion of the external haemorrhoidal plexus will give rise to an anal haematoma. A tender, tense, rounded, bluish swelling appears under the skin at any point in the circumference of the anal verge. There may be several such swellings. The patient complains of sudden pain or discomfort and very soon notices a swelling.

Treatment.—When an anal haematoma is seen soon after its occurrence it should be excised. This is easily accomplished by infiltrating the subjacent sphincter with proctocaine or any other local anaesthetic and excising the skin covering the clot. The clot or clots are then removed completely. Simple incision of the skin, with removal of the clot, leaves a linear wound which is undesirable, and, further, some blood clots may be overlooked. The flat wound resulting from excision of the skin is dressed daily with gauze soaked in a mild antiseptic—for example, eusol—and daily baths are given.

Hypertrophied Anal Skin Tags

Fibrous skin tags at the anus may not give rise to any symptoms other than difficulty in keeping this region clean. The skin surface, however, may become abraded, and infection results with swelling, oedema, and tenderness, and sometimes the formation of an abscess. Pruritus ani is frequently present. These skin tags may be excised in the same manner as the acute thrombotic variety. In mild cases careful cleansing and the application of lotions reduce the swelling. The following are useful lotions:

℞	Strong solution of lead subacetate	60 minims
	Cow's milk	to 1 oz.
℞	Strong solution of lead subacetate	8 minims
	Methylated spirit	120 „
	Recently boiled and cooled distilled water	to 1 oz.

It is important to remember that other cutaneous conditions occur at the anus—such as perianal warts, condylomata, primary chancre, and epithelioma. Furthermore, an oedematous skin tag may be due to infection within the anal canal, such as a fissure or inflamed crypt, etc.

Internal Haemorrhoids

The internal haemorrhoidal plexus is situated beneath the mucous membrane of the upper portion of the anal canal and the last inch of the rectum (Fig. 1). It is in

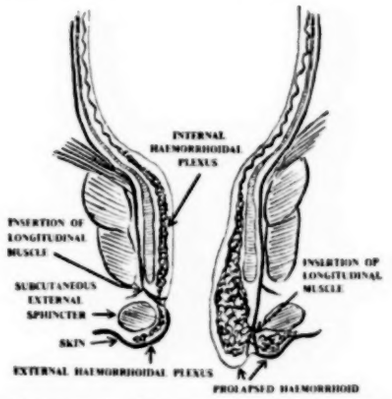

FIG. 1.—Diagram showing normal position of haemorrhoidal plexuses and also (on the right) their enlargement, producing a prolapsed internal haemorrhoid with an associated external haemorrhoid. Note depression at insertion of longitudinal muscle.

direct communication with the portal system, which is devoid of valves. Internal haemorrhoids result from dilatation of the plexus, low-grade inflammation with an increase of fibrous tissue, and an increased blood supply. Increase in size of this plexus is produced by straining at stool due to constipation or diarrhoea, portal obstruction, hereditary factors, and habitual use of certain aperients, more especially salts, aloes, or calomel.

There are as a rule three primary internal haemorrhoids, situated (assuming the midline anteriorly is at 12 o'clock) at 3 o'clock—the left lateral; at 11 o'clock—the right anterior; and at 7 o'clock—the right posterior. Each of these piles is supplied by a branch of the superior haemorrhoidal artery, which enters it from above and runs into the pedicle of the haemorrhoid. Secondary internal haemorrhoids may occur, and these are usually two in number—one between the right anterior haemorrhoid and the left lateral, and the other between the left lateral and the right posterior.

At first the haemorrhoids remain entirely in the rectum (first degree). As they increase in size prolapse through the anal sphincters occurs on defaecation, and the haemorrhoids reduce themselves spontaneously. When they become larger they have to be pushed back, and will remain in position (second degree). Finally the piles remain permanently prolapsed owing to their size and to overstretching and laxity of the anal sphincters, more especially overstretching of the longitudinal muscle of the anal canal (third degree). It will be seen on studying Fig. 1 that the longitudinal muscle coat of the anal canal is a continuation of the longitudinal muscle coat of the rectum, and that it is inserted at the base of an internal haemorrhoid at the so-called anal intermuscular septum. The depression seen on a prolapsed haemorrhoid at the junction of its covering mucous membrane with the modified skin of the anal canal is produced by the insertion of this muscle.

The internal haemorrhoidal plexus communicates freely with the external haemorrhoidal plexus, so that the increase in size of the former leads eventually to a corresponding enlargement of the latter. As a result there are often three external haemorrhoids corresponding in position to the three primary internal haemorrhoids. When an internal haemorrhoid remains permanently prolapsed (third degree) and the musculature overstretched and atonic, eversion of the anal canal occurs and the internal and external haemorrhoids become a composite mass. This type of pile is called an intero-external haemorrhoid.

Complications

Spontaneous thrombosis may occur in haemorrhoids of the first degree, but as a rule complications are seen in haemorrhoids which prolapse. If rapid increase in size occurs owing to diarrhoea or straining (a so-called acute attack of haemorrhoids) the prolapsed haemorrhoid will be caught in the grip of the sphincter muscles and strangulated. As a result of obstruction to blood return the haemorrhoid will become congested, and thrombosis arising from trauma and infection will ensue. Ulceration and gangrene of the internal haemorrhoids may occur, and there will be associated marked oedema of the skin at the anal verge due to infection or thrombosis in the external haemorrhoidal plexus itself. Occasionally severe spreading infection arises, and portal pyaemia may result. As a general rule, however, the acute condition subsides and the piles may undergo spontaneous cure or become much smaller as a result of sloughing and the formation of fibrous tissue. Repeated attacks of inflammation may lead to the formation of a fibrous polyp.

Symptoms

Pain is not a usual symptom of uncomplicated haemorrhoids, and the presence of pain means either that the haemorrhoids are thrombosed and infected or that there is some associated condition such as a fissure or an abscess. If internal haemorrhoids prolapse suddenly pain is severe owing to sphincter spasm and strangulation. When prolapse develops slowly, however, the sphincter muscles adapt themselves to the protrusion and no pain is experienced. Bleeding on defaecation is the commonest symptom of internal piles of the first degree, but bleeding may occur apart from defaecation in haemorrhoids of the third degree. The loss of blood, both into the rectum and externally, may lead to a serious degree of anaemia. When a small pile prolapses the patient often feels it slip out, and discomfort follows until it reduces itself or is reduced. Pruritus ani may result when there is prolapse due to leakage of mucus through the anus. Prolapsed piles of the third degree give rise to an increased discharge of mucus owing to inflammation of the exposed mucous membrane. Backache and mental depression often occur in patients suffering from piles.

Diagnosis

Unless prolapsed haemorrhoids covered by red mucous membrane are seen, the passage of a proctoscope is essential for the diagnosis of internal piles. Digital examination should first be carried out, but this alone will reveal the presence of a haemorrhoid only if it is thrombosed or there is definite thickening of the mucous membrane due to redundancy or chronic inflammation. A well-lubricated two-inch proctoscope should be inserted gently into the rectum to its fullest extent, the obturator removed, and the instrument slowly withdrawn. The upper limit of a ring of muscles surrounding the ano-rectal junction (the ano-rectal ring) will be seen (Figs. 2 and 2a), and if there are haemorrhoids present, as the instrument is slowly withdrawn they will protrude into the lumen so that the anal canal closes down in an irregular manner (rather resembling a camera shutter) (Figs. 3 and 3a). Should no haemorrhoids be present the contracting ring of muscles will be quite regular and circular. It is important to ask the patient to strain gently in order to assess the size of the haemorrhoids and the degree of

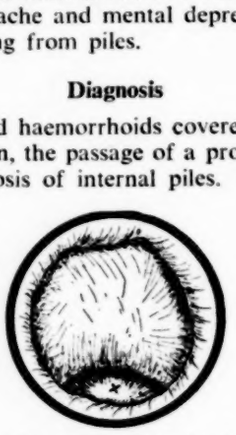

FIG. 2.—Ano-rectal ring appearing in the proctoscope. The × marks the site of injection.

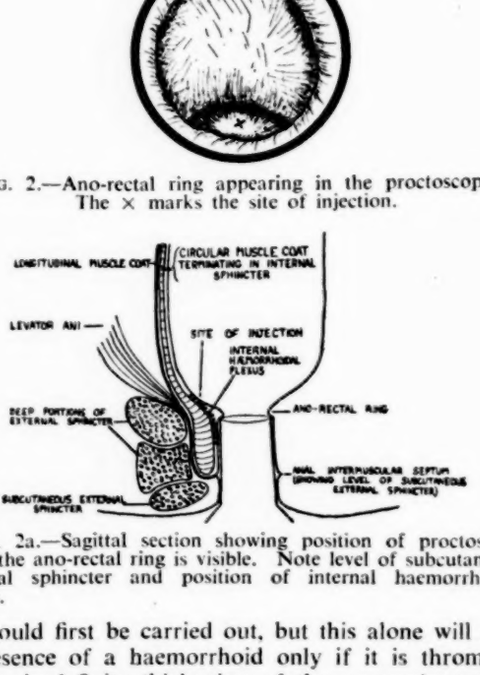
LONGITUDINAL MUSCLE COAT
(CIRCULAR MUSCLE COAT TERMINATING IN INTERNAL SPHINCTER
LEVATOR ANI
SITE OF INJECTION
INTERNAL HAEMORRHOIDAL PLEXUS
DEEP PORTIONS OF EXTERNAL SPHINCTER
ANO-RECTAL RING
ANAL INTERMUSCULAR SEPTUM (SHOWING LEVEL OF SUBCUTANEOUS EXTERNAL SPHINCTER)
SUBCUTANEOUS EXTERNAL SPHINCTER

FIG. 2a.—Sagittal section showing position of proctoscope when the ano-rectal ring is visible. Note level of subcutaneous external sphincter and position of internal haemorrhoidal plexus.

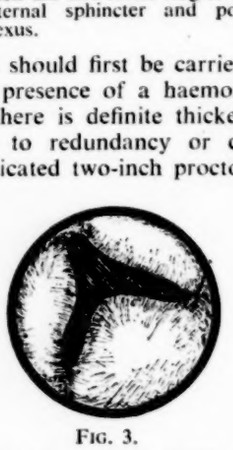

FIG. 3.

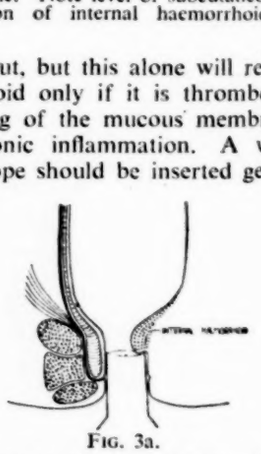

FIG. 3a.

FIG. 3.—The proctoscope has been withdrawn further than in Fig. 2, and shows internal haemorrhoids producing irregular closure of the anal canal.

FIG. 3a.—Sagittal section with proctoscope in a lower position. Compare Fig. 2a.

prolapse. When thrombosis and ulceration are present in piles of the third degree the fact that these complications have occurred in the rectal mucous membrane is quite obvious. The condition of the rectal mucosa above the piles should be observed, since bleeding may be due to haemorrhagic proctitis.

It must always be remembered that internal haemorrhoids may be associated with a carcinoma higher in the rectum, and the whole rectum must be examined carefully with a finger and sigmoidoscopy carried out, if possible, before the patient is finally discharged.

Treatment

Preventive.—Obstipation and constipation, by increasing pressure on the superior haemorrhoidal veins, predispose to haemorrhoids, so that regulation of the patient's habits is desirable. Straining at stool, sphincter spasm, the use of enemata, suppositories, and aperients, especially salts, calomel, and aloes, should be avoided. Urinary obstruction and uterine displacements must also be relieved.

Palliative.—If the patient has small internal haemorrhoids which bleed on defaecation only when the patient is constipated, correction of the constipation is all that is necessary. This is especially so in fat and plethoric women when there is rectal dyschesia and congestion of the mucous membrane. Haemorrhoids complicated by thrombosis, infection, ulceration, or gangrene should always be treated palliatively, since the risk of spreading infection by either injection or operation is very great. Furthermore, after an acute attack of haemorrhoids, either the haemorrhoids will be found to have cured themselves spontaneously or they will be so small that a few injections after an interval of six to eight weeks will suffice. For these cases rest in bed with the foot raised is essential. If internal haemorrhoids of the second degree have prolapsed suddenly reduction must be carried out. This is best accomplished by steady sustained gentle pressure on the protruding mucous membrane with a pledget of wool soaked in cold water. In difficult cases application of an ice-pack may be useful before reduction. When haemorrhoids of the third degree are thrombosed they should not be reduced, as their permanent place is outside the anus, as shown by the depression already mentioned between the oedematous external skin tag and the thrombosed internal haemorrhoid. Compresses of lotio hyd. perchlor. 1 in 2,000 or dettol 2 drachms to 1 pint should be applied and frequent hot baths ordered. Mild laxatives such as confection of senna, milk of magnesia, and liquid paraffin are used. In the majority of cases the pain and infection soon clear up and the haemorrhoidal mass shrinks.

(To be continued)

M. Py (*Thèses Lyon*, 1937-8, No. 13) records his observations on 2,029 scarlet fever patients, of whom 23.6 per cent. developed some form of renal complication. Early albuminuria was the most frequent and mildest, being found in 14.8 per cent. of the cases. It did not seem to predispose to further renal involvement, as only forty-five patients had a recurrence in the form of late simple albuminuria, and only five developed true nephritis. Late simple albuminuria was less frequent than the early form, being found in 145 cases (7.14 per cent.). In 100 cases it developed without early albuminuria, and in nearly half it occurred without obvious cause, while in the rest it was due to an intercurrent infection, especially diphtheria and measles. True nephritis was the rarest form of renal complication, being found in only seventy cases (3.44 per cent.), in twenty-six of which it was early and in forty-four late. The prognosis was worst in the early cases, as thirteen of the twenty-six patients died, while there were only six deaths among the later cases.

HUNTERIAN DINNER AT THE COLLEGE OF SURGEONS

The biennial Hunterian Festival in commemoration of John Hunter's birthday was held, as usual, at the Royal College of Surgeons of England on February 14. In the afternoon Mr. W. Sampson Handley, consulting surgeon to the Middlesex Hospital, delivered the Hunterian Oration, of which the abridged text appeared in last week's *British Medical Journal*. On the evening of the same day the Hunterian dinner was held at the College, the guests being received by the President, Mr. Hugh Lett, and the Vice-Presidents, Professor G. Grey Turner and Professor R. E. Kelly.

Hunter's Abiding Influence

The President, in proposing "The Memory of John Hunter" (which was toasted in silence), said that the story of Hunter's boyhood foreshadowed the greatness of the work he accomplished as a man. John Hunter by his genius brought science to surgery, which was then but an art and craft. He was the first among the great comparative anatomists to show the gradations between the simplest and most complex forms of animal existence, to demonstrate the gradual development from the lowest to the highest forms of life, and to bring anatomical variations in them all into one great ordered scheme. For him it was but a short step from anatomy to pathology: to attempt to discover within the body the changes that gave rise to disturbing symptoms and disordered functions. He could not tolerate vague theories, or treatment that was founded on tradition; he tried to find a reasonable ground for it. When in his dissections he could not find the answers that he sought, he went still further and carried out experiments even on himself. The President then spoke of the great collection made by John Hunter for his museum, which was bought by the nation and entrusted to the Surgeons' Company, later to become the Royal College of Surgeons. He gratefully acknowledged valuable recent additions from many sources. "But while we may regard the Museum as an emblem of John Hunter, we seek to perpetuate his work in yet another way. He believed that surgery was essentially a scientific discipline, and that the experimental method was necessary for its advance." The College had taken Hunter's phrase, "Don't think—try," as a motto in its efforts to develop biological research. Its accommodation for this purpose was vastly increased rather more than a year ago when the Bernhard Baron Research Laboratories were opened by Lord Athlone. With the Buckston Browne Farm these formed a research department of which the College was justly proud. Under the wise guidance and inspiring enthusiasm of Professor John Beattie much had been done already, and results of great practical importance had been obtained. Apart from that side of the work the laboratories had a special value in the opportunities they offered to young surgeons in making a scientific approach to surgical problems. The President expressed the thanks of the College and of its research staff to the Bernhard Baron Trustees and Sir Buckston Browne for their generous gifts, and to the Medical Research Council, the Rockefeller Foundation, the Beit Trustees, the British Medical Association, and other organizations who supported individual workers or financed investigations in the College laboratories. As generation succeeded generation the Royal College of Surgeons endeavoured to fulfil the words laid down in its first charter —"duly to promote the art and science of surgery"—guided by the inspiration and example of John Hunter.

Guests of the College

The toast of "The Guests" was proposed by Professor Grey Turner, who said that the Hunterian dinner gave an opportunity to the College to gather round influential friends who were interested in its work and in its house. The College was not perhaps as well known as it should be to the world at large. It was impossible to deal adequately with so eminent a body of guests, but he welcomed in particular the

Archbishop of Canterbury and the Dean of Westminster, several Trustees of the Hunterian Collection, including Lord Athlone (Chancellor of the University of London, whose devotion to medical education they all admired), and Lord Atkin, notable for his efforts on behalf of forensic medicine; with other leading representatives of the Law, Masters of City Companies, the heads of the Medical Services of the Armed Forces, Lord Dawson (an honorary Fellow of the College), and Dr. John Henderson, President of the Royal Faculty of Physicians and Surgeons of Glasgow and an official descendant of the famous Peter Lowe. Professor Turner ended with a fine tribute to Sir Humphry Rolleston, who, in his reply to the toast, said that the Royal College of Surgeons had always been able to call upon its own orators to speak with the tongues of men and of angels—William Lawrence, James Paget, William Savory, and Moynihan. Throughout the years it had gone on adding to and improving its treasure-house, the Hunterian Collection, and had created new knowledge, much of it aided by recent benefactors. Lastly, it had given its blessing and encouragement to new colleges over-seas.

Mr. Eric Pearce Gould proposed the health of "The Hunterian Orator," recalling with pride that Wiliam Sampson Handley's life-work had been done at the Middlesex Hospital. It was in 1905 that he gave the first of his many Hunterian lectures and joined the Middlesex staff. "That still small voice has reached far and wide; to few of any generation is it given to gain world-wide recognition such as Sampson Handley has had this thirty years." Mr. Pearce Gould characterized the eightieth Hunterian Orator as a lusty fighter worthy of his middle name, a man of originality and courage. Mr. Sampson Handley, in reply, said that here, in the presence of a cross-section of the ruling, thinking, and directing elements of our national life, he was proud to round off a great day in his life, and to be toasted by the son of Sir Alfred Pearce Gould, who did much to found cancer research at the Middlesex Hospital.

After dinner the Museum was open for inspection and an exhibition of library treasures was on view in the Council room.

SCIENCE AND INDUSTRY

The annual report of the Department of Scientific and Industrial Research[1] discloses the immense field covered by the activities of the Department and the number of problems whose solution is being sought through the co-operation of science and industry. Many of them are of interest to medical workers.

Food Storage and Transport

Special attention is called to the results achieved under the Department's Food Investigation Board in the last few years. In this period the problem of the preservation of fruit, in particular home-grown varieties which respond badly to ordinary cold storage, has been solved by the development of a new method known as "gas-storage." In principle the method depends on adjusting the ventilation of cooled stores so that their atmosphere contains just the right amount of carbon dioxide—the gas breathed out by the fruit. "Ten years ago," the report states, "there were no gas stores. To-day they provide three million feet of storage, and this is only a beginning. Moreover, the application of the principles to other fruits and vegetables is being explored."

Up to 1933 Australia and New Zealand could only send us frozen beef—not a very satisfactory product—but, as a result of the Department's work, it has been shown that chilled beef can be preserved long enough in special chambers enriched with carbon dioxide gas. This discovery has been rapidly applied commercially, and in 1937 Australia and New Zealand sent to this country some three-quarters of a million hundredweights of chilled beef carried in this way. Again, fish, as ordinarily handled and stowed in crushed ice, cannot be kept really fresh for more than ten to twelve days. Methods have been developed by which lemon soles, for example, have been stored for two years and were in excellent condition at the end of that period. Although some work has been done on canned foods and bacon, in the main the problems of the processing of food—curing, canning, jam-making, etc.—have been regarded as less pressing than research required to bring fresh food to the consumer in the best possible condition.

[1] H.M. Stationery Office. Cmd. No. 5927. 3s.

Bread and Butter

Reference is made in the report to an investigation into the nutritive value of bread. The results emphasize the importance of bread and butter in the dietary. It has been shown that certain fats, such as lard or butter, reduce the effects of calcium deficiency in the diet, presumably by rendering the actual calcium content of the food more completely assimilable. "At the same time it is well known that fat is not completely assimilated by the body except when eaten with a relatively large excess of carbohydrate such as bread or potatoes."

Occupational Footwear

The Boot and Shoe Research Association has been studying the possibility of designing occupational footwear. "It is customary to have various kinds of special shoes for games and many leisure employments, yet most people spend most of their time at their work, and it is during the work period that there is greatest opportunity for faulty footwear to damage the health. There is a growing volume of evidence that many ailments like headaches, backaches, indigestion, and internal derangements may be caused by unsuitable shoes and be cured when the shoes are corrected. Consequently, there is no doubt that the usual practice of wearing any kind of shoes whilst at work is wrong, and that research will do a valuable public service in working out the best types of footwear for various kinds of employment. Good progress in this research has been made, and test shoes have been issued to numbers of workers in selected occupations. These workers are under expert medical supervision and indications of health benefits from the shoes will be recorded statistically." As part of the work, investigations have been carried out into the problem of the effect of high-heeled shoes on health. While it is too early to draw definite conclusions, the indications are that the best height of heel is governed by a woman's occupation and the customary poise which her occupation may impose.

Noise and its Prevention

Much work has been carried out at the National Physical Laboratory which should reduce noise of all kinds. An investigation into the noise of motor horns undertaken for the Ministry of Transport has been completed, and as a result it has been recommended by the Departmental Committee concerned that, under specified conditions of test, the noise of a motor horn should not exceed 100 phons at a distance of 20 feet. For the Institution of Automobile Engineers investigations are in progress on the silencing of motor cycles and the reduction of drumming in motor-car panels. Measurements have been made for the London Passenger Transport Board to assist in the lessening of noise in tube trains. Other work of the same nature has included the measurement and analysis of noise from aero engines in test houses, and of noise in factories, offices, and other buildings. In the field of architectural acoustics work has continued, with the Building Research Station, on the transmission of sound through floors, walls, and building members.

Miscellaneous Points

The following are some further points from the report. During the year 1937–8 upward of 530,000 clinical thermometers were tested. It has been found that goods washed and finished in the laundry are much more nearly free from bacteria than goods washed and dried in the home. New uses for rubber are likely to be found as a result of the development of the Rubber Research Association of a simple process for preparing powdered rubber from plantation sheet or crêpe.

The factors which affect the ease of the starting of motor engines from cold are being studied, and it has been shown that by minor alterations of engine design the power of the engine to overcome its internal friction can, under certain conditions, be doubled. The case of persistent contamination of beer by a sulphurous odour has been investigated by the Chemical Research Laboratory and the trouble removed; the variety of bacteria responsible for the trouble was isolated and the infection traced to the brewery cellar floors. In studying the polluting effluents from milk factories it has been found that if adequate drainage trays for churns were installed at all the milk depots and factories in this country the total saving of milk would be roughly three million gallons a year.

INTERNATIONAL UNION AGAINST TUBERCULOSIS

Berlin Conference, 1939

The eleventh conference of the International Union against Tuberculosis, whose permanent headquarters are in Paris, 66, Boulevard Saint-Michel (Secretary-General, Professor Fernand Bezançon), will meet in Berlin from September 16 to 20, 1939, under the chairmanship of Dr. Otto Walter.

Discussions will be limited to three main subjects: Biological subject, "The Problem of the Virulence of the Tubercle Bacillus," opening report by Dr. A. Boquet (France) and Dr. A. Saenz (Uruguay); clinical subject, "The Value of Systematic Examinations for the Detection of Tuberculosis in Subjects over 15 Years of Age," opening report by Dr. H. Braeuning (Germany); social subject, "The Rehabilitation of the Tuberculous," opening report by Sir Pendrill Varrier-Jones (Great Britain) and Dr. E. Bachmann (Switzerland). Speakers selected in advance from a list presented by the forty-three countries belonging to the Union have been designated to open the discussions on each of the questions on the agenda, as under:

Biological Subject.—Denmark: Dr. K. A. Jensen. Germany: Professor Bruno Lange. Great Britain: Dr. A. Stanley Griffith and Dr. William T. Munro. Italy: Professor B. Besta and Dr. Carlo Cattaneo. Poland: Dr. Z. Skibinski. Portugal: Dr. Alberto Carvalho and Dr. Carlos Vidal. United States: Dr. Kenneth C. Smithburn. Yugoslavia: Professor J. Nedelkovitch.

Clinical Subject.—Argentine: Professor G. Araoz Alfaro and Dr. R. A. Vaccarezza. Finland: Dr. Toivo Ellilä. France: Dr. P. Braun and Dr. A. Courcoux. Great Britain: Dr. F. R. Heaf. Italy: Professor G. Costantini. Norway: Dr. H. J. Ustvedt. United States: Dr. Willard B. Soper. Yugoslavia: Professor F. Tchepulitch.

Social Subject.—Belgium: Dr. G. Derscheid. France: Dr. L. Guinard and Dr. Etienne Bernard, Germany: Dr. Dorn, Italy: Professor F. Bocchetti and Professor F. Parodi. Netherlands: Dr. W. Bronkhorst. United States: Dr. Kennon Dunham.

The Organization Committee of the Conference has prepared a fine programme of receptions and excursions, thanks to which the members of the Congress will be able to visit the chief German cities and to become acquainted with the remarkable social institutions in Germany. Members of the International Union are invited to take part in the Conference free of any contribution fee. They may forward their application either through the medium of their Government or their National Organization against Tuberculosis, or direct to the Organizing Committee in Berlin, at the following address: Konferenzleitung der XI. Konferenz der Internationalen Vereinigung zur Bekampfung der Tuberkulose, Berlin, W.62, Einemstrasse 11. Persons who are not members of the Union and who wish to take part as "Members of the Conference" must forward their application, together with a contribution of 20 Reichsmarks (about 300 French francs or £1 15s.) exclusively through the medium of the National Association for the Prevention of Tuberculosis, Tavistock House North, Tavistock Square, London, W.C.1. Members of the family accompanying a member of the Union or a member of the Conference will be entitled to the same privileges on payment of a fee of 12 Reichsmarks. Reductions on hotel prices and railway fares will be granted to members of the Congress.

Nova et Vetera

LOUIS XIV, 1638-1715

In the tercentennial year of his birth, the thoughts of the historian have turned to the heroic, if disastrous, achievements of a Grand Monarch, and the physician scans the medical narrative of a surprisingly healthy man whose robust constitution triumphed over diseases, doctors, and drugs.

Small-pox at the Palace

At the age of nine years Louis XIV was attacked by confluent small-pox with delirium, diarrhoea, and gangrene of the toes. Though desperately sick, he recovered and only his face remained permanently pock-marked. To show the prevalent seriousness of the disease, these royal statistics are impressive: in the space of sixty-three years, five of the king's immediate descendants died of small-pox—the Dauphin of France in 1711; his son, the Duke of Burgundy, and the latter's wife in the following year; their son, the Duc de Bretagne, was the next victim; and in 1774 Louis's great-grandson, Louis XV, succumbed to a second attack.

When the seventeen-year-old king contracted syphilis, the diplomatic ingenuity of the Court was greatly strained, for the nature of the disease had to be concealed from the patient as well as from his subjects. His next illness, typhoid fever in 1657, is of particular interest because of its treatment with tartar emetic. Though antimony had been discovered some two hundred years previously by the alchemist Basil Valentine, its medicinal virtues continued to be keenly disputed. Since Louis managed to survive so dangerous and ill-advised a drug, antimony promptly acquired a startling popularity in the seventeenth century. In this connexion it is interesting to recall that ipecacuanha about 1680 was extensively prescribed as a secret remedy for dysentery by Adrien Helvetius, from whom Louis in 1688 purchased the formula for 20,000 francs. In 1660 the king married the Infanta Maria Theresa from whom three years later he caught measles of exceptional virulence. During his convalescence, rumours spread about that His Majesty was inhabited by a gigantic tapeworm, and for a number of years the royal physicians had to issue bulletins describing in intimate detail various imaginary specimens, dead or alive, which the patient had expelled.

Royal Midwives and Royal Surgeons

In 1670 Louis requested Jules Clément (who in 1663 had already attended La Vallière of virginal charm) to assist his mistress, the Marquise de Montespan, at the birth of the future Duc de Maine, and, by rewarding him with the official title "accoucheur," dignified and popularized male midwifery in France. At the age of forty-seven the king developed a gluteal abscess which grew into a rectal fistula. After an interval of six months, during which he had secretly mastered the technique of the operation, Charles François Félix, the Court barber and surgeon, successfully opened the fistula with a specially designed falciform knife, the "bistouri royal," receiving from his grateful patient a farm, 300,000 livres, and a title. As a result of this operation the status of the French surgeon was greatly improved, and fistula in ano became a fashionable complaint. Louis, whose appetite was as prodigious as his dyspepsia was obstinate, had poor teeth and worse gums. In his youth, extraction of a tooth had led to injury of the jaw, and subsequent decay of a bony fragment was accompanied by foul nasal discharge and life-long offensive breath. This explains why poor Madame de Montespan soaked herself in perfume when she had to be with her lover. Towards the end of his life Le Roi Soleil was visited by arteriosclerosis and tormented by gout and stones in the bladder. He died of "gangrene from the pia and dura to the toes" on September 1, 1715, in the seventy-second year of his reign and in the seventy-seventh year of his age.

Reports of Societies

USE AND ABUSE OF PURGATIVES

At the meeting of the Medical Society of London on February 13, with Dr. C. E. LAKIN in the chair, a discussion was held on the use and abuse of purgatives.

Sir ARTHUR HURST, after some remarks on the physiology of the colon, said that some thirty years ago, as a result of observations with *x* rays, he had suggested that cases of constipation might be divided into two groups—namely, those characterized by slow passage through the colon, and those showing dyschezia or inefficient defaecation. He was not at all sure now whether all cases of constipation might not be due to dyschezia. It appeared quite possible that those cases in which the right side of the colon did not empty properly were due not so much to colonic defect as to a deficient defaecation reflex. Taking the last fifty cases he had seen in which the patients came complaining of constipation but in which the condition was due to what he called abuse of purgatives, he found that two-thirds of them were women. Although they complained of constipation, when asked what their stools were like they said liquid or soft—that is to say, they were suffering not from constipation but from diarrhoea. Because they had mucus in the stools many of them had been told they had colitis. All of them had abdominal discomfort associated with flatulence and distension. Some, in addition to discomfort, had actual attacks of pain, for which attacks some of them had had the appendix removed. A proportion of them had the additional symptom of anorexia. A certain number were in the habit of taking gigantic doses of aperients. One woman took sixty senna pods every night, another took forty "Carter's little liver pills" every night. Some of these women thought they were constipated not because of any irregularity in their bowels but because their symptoms were exactly what they read about in the advertisements!

Vegetable Mucilages and Paraffin

Coming to various classes of purgatives, Sir Arthur Hurst first mentioned vegetable mucilages and paraffin. The introduction of paraffin and agar-agar was an enormous boon, because those two things could to a great extent replace all purgatives. He thought paraffin rather less satisfactory than vegetable mucilages because it tended to make the defaecation fragmentary; vegetable mucilages also had less tendency to produce flatulence. Of the various mucilages agar-agar was quite good. The French preparation coréine was, he thought, the best of all. Isogel, an indigestible vegetable mucilage which swelled up in the presence of water to make a jelly, was also useful. A teaspoonful of agar or coréine or isogel twice a day was the best means of keeping the faeces soft, and could replace practically every aperient.

He realized that there were a few patients who had a true constipation and in whom such treatment as re-education with the aid of enemas was useless. There were people, such as those with high blood pressure, for whom evacuation must be made as easy as possible. Although there were so many purgatives available, the single one he used in such cases was an infusion of senna pods. So far as he knew it was unique among purgatives in that it acted upon the colon only. It increased the rate of flow through the colon. All other purgatives increased the rate through the small intestine, and that resulted in the arrival in the colon of liquid faeces containing undigested and unabsorbed protein, carbohydrate, and fat, which underwent bacterial decomposition. The advantage of senna was that, in moderate doses, it acted only upon the colon; also that the patient could very easily regulate the dose himself. He could alter it from day to day, and a great many patients could educate themselves gradually to do without it altogether. It was sometimes said to produce colic, though if a cold infusion was used it very rarely did. To sum up the whole subject, he would say that the abuses of purgatives were many, their uses very few.

Types of Constipation

Dr. H. L. GLYN HUGHES discussed the question from the angle of the general practitioner, who had most to do with cases of habitual constipation and was called on to be a sort of missionary among the masses, to teach them good habits. The use of purgatives constituted a very real danger, and it would be impossible to overestimate the prevalent abuse. It was almost time purgatives were included in the list of dangerous drugs. The rush of modern life, irregular habits, the refinement of foodstuffs, the small amount of water drunk, the increased use of the motor-car with, as a consequence, less bodily exercise, all favoured the development of constipation and the purgative habit. He instanced four types of constipation which had to be considered by the general practitioner: atonic constipation, spastic constipation, dyschezia, and constipation depending on abnormal conditions in other organs. In the spastic type all hard substances should be eliminated from the diet and gaseous foods reduced. He thought that even massage might be harmful in certain cases. In the atonic type aperients might have to be used to re-educate the bowel, but on the definite understanding that they should be given up as soon as possible. Constipation due to disease elsewhere included that arising in febrile disturbances, diabetes, and diseases of heart, liver, and kidneys, and in practically all of these it was harmful to prescribe aperients. In febrile states, when the patient was already probably dehydrated, further removal of body fluids might have serious results. In cases where a patient was subject to urinary disorders he was quite sure an attack might be set up by overpurgation. A number of people who complained of constipation were not really constipated at all, while other people were really constipated but were not aware of it. Lavage of the large intestine was often of great value in dealing with cases of irritation of the lining membrane. In the atonic type of constipation the anthracene group of purgatives were most useful, especially cascara and rhubarb. Drastic purgatives were not of very much use, except perhaps castor oil, which had the advantage of producing a single evacuation with complete emptying. But he emphasized that very few acute illnesses could be relieved by emptying the bowel; it mattered little if the bowels were left for several days. There might be great variability in the number of bowel evacuations; some patients had two or three a day, others went for two or three days and suffered no loss of health. He referred also to the abuse of alcohol as a purgative. In his view it set up a catarrhal condition.

Food Factors

Dr. F. PARKES WEBER declared that the most rational treatment of habitual constipation in adults was for the patient to eat with meals properly prepared bran in quantities found appropriate for the individual case. In some cases of spastic constipation bran treatment was probably unsuitable, but in any case it could be discontinued if it was thought to be doing no good. The action of properly ground bran was very similar to that of the mucilaginous substances mentioned by Sir Arthur Hurst. With regard to the whole question of constipation, physicians and nurses in Germany, and also in Switzerland, had told him that in their countries habitual constipation requiring treatment was hardly known, and they thought that the frequency of constipation in England argued something wrong in diet or in education in infancy and childhood. But in England he believed there had been a considerable diminution lately owing to the increase of hygienic and dietetic knowledge.

Dr. WRATHALL ROWE referred to the value of vitamin B_1 in the diet in preventing constipation. He understood that our ancestors in mediaeval times were accustomed to consume something like five hundred times the amount of vitamin B_1 that was consumed nowadays. The greater refinement of bread as now consumed was the cause of the diminution. Mr. ZACHARY COPE protested against the wanton way in which surgeons were often overpersuaded to agree to the use of purgatives. The average layman and nurse believed that a purgative was one of the necessities for a patient to undergo an operation and also following the operation. Many patients who used to be brought to operation after a drastic course of purgatives had their bowels in a condition not suitable for operation. It was wrong also to give purgatives too soon or too often after operation. To give purgatives immediately after an operation for peritonitis was to court disaster by spreading infection through the rest of the abdomen. Certainly it was well to wait two or three days before disturbing the bowel at all. Dr. GORDON BRYAN said that it seemed to be generally taken for granted that continuous paraffin drinking for years had nothing but a mechanical effect. Was it a fact that paraffin did not have any effect such as other aperients had in producing colonic spasm and so forth? He had been convinced for some time that chronic abdominal symptoms often dated from the time patients became habitual paraffin drinkers.

General Discussion

Dr. C. E. LAKIN said that he felt they must be fair to the pill. He knew an old doctor who still practised at the age of 87, and had taken for the greater part of his life a rhubarb pill every night. It had always seemed to him a curious thing that the retiring hour should be commonly chosen as the time for the taking of the pill. Sleep surely was the time when peristalsis was most quiet. If pills had to be used, either immediately before or immediately after the evening meal, when peristalsis would be starting, seemed to be the appropriate time. Dr. L. CARLYLE LYON referred to the danger of taking purgatives during abdominal pain. This might convert a subacute appendix into an acute one. Mr. J. E. H. ROBERTS said that until the medical profession settled down to some agreed opinion as to purgatives he did not think they ought to abuse the public for credulity. Professor PLESCH discussed the function of Bauhin's valve in relation to the mechanics of intestinal propulsion. He also mentioned that senna injected into the blood stream worked just as well as an aperient as if it were taken by the mouth.

Sir ARTHUR HURST, in replying on the discussion, said that he thought that one drug was extremely useful in cases of spastic colon—namely, belladonna in small doses. Aloes and cascara had been mentioned as the equivalent of senna, but in his view senna had a distinct advantage over all the others in that it acted on the colon alone. In addition, salts, particularly Epsom salts, had a great value. He did not agree with Dr. Parkes Weber that constipation was virtually unknown on the Continent. There was an enormous foreign literature on the subject. One German author spoke of "thousands" of patients with constipation, and Sir Arthur Hurst added that the translation into French of his own book on the subject sold much more quickly than the English edition. He entirely agreed with the surgeons as to the inadvisability of using aperients before and immediately after operations. He found on recent inquiry at his old hospital that the former habit of giving big doses of aperients had been given up, except, curiously enough, in rectal surgery—the one field where, he would have thought, aperients were most undesirable. He cited an interesting example of the custom of nurses in continuing an old tradition. The letters "t.t.s." still appeared to have a great significance: they meant ten, two, and six o'clock as the times for giving drugs to patients, and some investigation showed that they dated back to lectures given to nurses as long ago as 1820. As for the time to take the pill, on which the president had spoken, the theory was that if it was taken last thing at night it would probably reach the caecum just about the right time in the morning, when the normal reflex took place. Sir Arthur Hurst concluded with two quotations, the first from Swift's *Gulliver*: "They command us to take in at the orifice above a medicine, equally annoying and disgustful to the bowels; which relaxing the belly, drives down all before it; and this they call a 'purge.'" The other quotation was from Burton's *Anatomy of Melancholy* and related to the virtues of senna: "A wonderful herb against melancholy, it scours the blood, lightens the spirits, shakes off sorrow, a most profitable medicine."

SHOCK THERAPY: A PLEA FOR PROPORTION IN PSYCHIATRY

At a meeting of the Section of Psychiatry of the Royal Society of Medicine on February 14, Dr. H. CRICHTON-MILLER presiding, Dr. IAN SKOTTOWE read a paper which he entitled "Shock Therapy: A Plea for Proportion in Psychiatry."

Dr. Skottowe said that shock therapy might be taken as meaning the induction of a sudden mental impression, but nowadays it had come to mean the exhibition of insulin or other drugs in such doses as to induce coma or epileptiform convulsions. It was common knowledge that there were extreme variations of opinion and observation, not only as to the efficacy of the treatment but also as to the range of spontaneous remission in schizophrenia. Given a reasonable degree of standardization of the technique of treatment, it was obvious that the explanation of the remarkable variations in the recorded results must be sought not in the treatment but in the clinical material to which the treatment was applied. In present-day usage in this country there was a tendency to mean by "schizophrenia" a particular disease or pattern of reaction marked by withdrawal from reality, erratic behaviour, apathy, and deterioration. He did not consider these criteria at all satisfactory, and he believed there were qualitative differences between the various types of cases seen in the schizophrenic field. From observations which had been made on an admittedly small but closely observed number of shock-treated cases he believed that a reorientation of the clinical signs seen in cases within the general field of schizophrenia revealed the existence of at least three types of cases which called for differently arranged and proportioned forms of therapy.

Three Groups in Schizophrenia

The first group was characterized by dys-symbole—failure of the conceptual thinking processes—so that thoughts at this level could not be intelligently formulated in language. From this failure arose thought-blocking, incoherence, and neologisms. It was invariably accompanied by peculiar head sensations. Emotional material had to be dealt with by a damaged integrating machine, and so the bizarre quality of the florid symptoms (delusions, hallucinations, and the like) was seen. The second group was characterized by dyskinesia—that is, fragmentary or incomplete movements which were purposeless in relation to their setting, and were often associated with toxic or passing confusional states; many of the cases were of breakdown during the puerperium. The third group was characterized by simple paranoid thinking, often associated with guilt and inferiority, so called to distinguish it from bizarre paranoid states which were really florid manifestations of dys-symbole.

He described typical cases in each of these groups, especially the first, in which the patient could not use the right symbols to convey what was in his mind or what he felt; he was aware of the subjective change, that something had gone wrong with his thinking process, but he could not formulate what it was. The condition appeared to have the same relation to conceptual thinking as dissociation had to the psyche as a whole. Cases in this first group, characterized by dys-symbole, failed to show recovery with shock therapy; at the best the therapy

only abated the florid symptoms. The second group, characterized by dyskinesia, invariably showed improvement under the therapy and usually recovered; and cases in the third group, that of simple paranoid thinking, did well with shock therapy adjuvated by psychotherapy, though the existence of a paranoid pattern implied inability to withstand a major emotional stress. Insulin was the method of choice if the patient was not robust because it was easier to control. If the patient was robust and economy and speed were major considerations analeptics should be tried first. If either form failed it was better to summate the two than to try the alternative alone. In any event shock therapy should be regarded only as part of a therapeutic scheme. A review of recorded observations suggested that shock therapy acted by stimulating the sugar–oxygen metabolism of the nervous system, in which the cells were in a state of biochemical stagnation.

Enthusiasm for New Treatments

Dr. J. BRANDER said that at the hospital which he served his colleagues were enthusiastically carrying out shock therapy. He hoped it would be extended, and he looked forward with interest to observing the results. At the same time he quite anticipated that in 2039, when present shock therapies had been forgotten, a successor of Dr. Skottowe would again advance a claim for proportion in therapy. It was right and proper that every new treatment should be received with enthusiasm and exploited to its limits; otherwise many valuable opportunities for cure would be missed. The one and only test of therapeutic efficiency in any case was the ability of the treatment to achieve a desired result in an individual patient.

Dr. Skottowe had introduced a somatic grouping of types which he had found useful. Without systematic clinical application of the standards he had described others might feel some difficulty in appraising their value immediately, and still more difficulty in following him when he courageously subdivided the mind and almost—not quite—related conceptual and perceptual thinking to areas or levels of the brain. Were they not too prone to seek out constant parts of the mind or brain, ascribe to them qualities or functions, and reconstruct the whole according to their preconceptions? Some time ago he collected particulars of all patients admitted into a mental hospital over a period of five years. He left the diagnosis vague, but most of the cases were schizophrenic. Of those under 30, with a history of a first attack dating back for less than one year, 60 per cent. of the females and over 50 per cent. of the males were discharged recovered or to the care of their friends as meriting what he agreed was the equivocal description of social recovery. At that time no intensive psychotherapy was practicable, and the improvement which occurred was spontaneous. To-day, with insulin and cardiazol, with treble the nursing staff, with intense occupational and recreational therapy, the recovery rates seemed to be improving, though they were not better than were obtained in hospitals in which an enthusiastic staff had been able hopefully to give intensive study and care.

Shocks, physical and psychological, had been in vogue in therapy and successfully practised for centuries. The shock of certification itself was of high therapeutic value; it sufficed to expedite recovery in a young man discharged from his institution only the previous week. The physiological findings in schizophrenia were infinitely variable and not consistent. Was it conceivable that a uniform treatment could be of equal benefit? The causes of excitement could not be numbered, and yet they were told that cardiazol was the treatment of choice in all cases. Nevertheless he agreed that shock therapy had introduced into psychiatry an enthusiasm and hope formerly lacking; it had also encouraged psychotherapists and even general physicians to show interest in the biochemistry of insanity, and that was all to the good.

Dr. EDWIN GOODALL said that there was no evidence that the results of this therapy had anything to do with the oxidation or failure of oxidation of the brain cell. He was interested especially in the relation of this so-called schizophrenia to catatonia, and he thought it might well be put to experimental test to discover whether there was a deficiency of brain cell oxidation in catatonic stupor as produced in dogs or cats, and whether by administration of the shock- or fit-producing agents oxidation was increased.

The discussion was continued by Dr. ISABEL WILSON, Dr. DORIS ODLUM, Dr. WILLIAM MOODIE, and Dr. R. STRÖM-OLSEN, the last remarking that many of the favourable results with shock therapy might be in cases of an atypical group. Until more definite diagnostic criteria were available he thought the present voluminous literature was almost valueless as a means of assessing treatment.

Possibility of Misleading Differentiations

Summing up from the chair, Dr. CRICHTON-MILLER said that he wondered, after hearing the very contradictory views and references to literature, how far they were not seeking to find an identity where there was no identity at all. How far were they trying to find absolute rules and predictable reactions where they never would find them? For example, to go no further than the whole question of dissociation in the wider sense of the term, they all knew that certain phenomena of dissociation could be produced by purely biogenic causes. In these circumstances it seemed understandable that a particular case which Dr. Skottowe had described should respond to a certain extent, in so far as the dissociation was biogenic in origin, to shock treatment, and thus be rendered accessible to psychotherapeutic treatment, and go on to respond to that. It was almost fruitless to seek pure causes. Dr. Skottowe had been differentiating certain types, each of which was likely to respond or not to respond in a certain way. But was the search for a pure type likely to be more successful than the search for a pure infection of the common cold? Was it not possible that these vastly different manifestations of dissociation might not in the end prove themselves as heterogeneous as such an infection, and the treatment of schizophrenia never get further than the stage represented by the treatment of the common cold?

SCIATIC PAIN

At a meeting of the Section of Physical Medicine of the Royal Society of Medicine on February 17, with Dr. K. R. COLLIS HALLOWES in the chair, a discussion took place on sciatic pain.

Dr. J. H. KELLGREN described sciatic pain as a pain having a characteristic distribution down the back and sides of the leg. It might be associated with other phenomena—for example, general or even localized muscular wasting in the affected limb, absence of knee-jerks, and very occasionally sensory changes in the skin. He discussed the theories of causation of the neurological and orthopaedic schools, and said that with increasing knowledge of nerve function it became difficult to explain the various phenomena associated with sciatic pain on the basis of a lesion of the nerve trunk; thus the idea of a radicular lesion came in. On the side of the orthopaedic school the idea was put forward that the widespread distribution was not due to pressure on nerve trunks or roots, but to a localized lesion somewhere in the trunk giving rise to what was described as referred pain, and it was suggested that lesions of the spine might produce this pain. Some German and Scandinavian workers had suggested that the pain was usually, if not always, due to a lesion of muscle. But throughout the argument as to the various orthopaedic causes of pain there had been no clear understanding whether the pain was referred from

a localized lesion in ligament, muscle, or bone, or was due to the pathological pressure spreading to neighbouring nerve roots and trunks and producing pain at a distance. Some experimental work in which he had recently been concerned, following the injection of irritating substances into deeply lying tissues, had shown that all the deep somatic structures gave rise to pain deeply localized. He thought sciatic pain distributed down the back and sides of the leg must be regarded as arising from deep structures supplied by the fifth lumbar and the first and second sacral segments, this, of course, including the corresponding nerve roots.

Dr. C. W. BUCKLEY said that there were sites where tenderness might be elicited which was of diagnostic importance; one of these was just internal to the sacro-iliac spine. Earlier observers attributed the tenderness to the sacro-iliac joint itself, but he thought there was little doubt that it was the ligaments which were tender and inflamed. Tender nodules were frequently to be detected along the iliac crest, but nodules or thickenings which were in no way tender were more common. One thing to bear in mind was that sciatica seemed to have a natural tendency to recover, though it might be long in doing so. He instanced the features which it was well to look for in any case of sciatica. These included the possibility of the posterior displacement of the fifth lumbar vertebra, which was commoner than was sometimes thought, and the impingement of the spinous processes on each other, which again was not uncommon. Habitual defects of posture, both in standing and sitting, as in driving a car, should be noted.

Dr. J. B. MENNELL said that he had always felt that an orthopaedic surgeon should keep to his surgery and that an orthopaedic physician was seriously needed. The result might be better for the patient if the old regime still existed whereby the surgeon was not consulted except on the advice of the physician. When a joint was in any trouble the muscles controlling it were in a state of tension or spasm to prevent any painful movement. That was part of the normal reflex of self-preservation. It followed that if the muscle could not relax it could not exert its pumping action, and so a large amount of waste products would not be pumped away. But surely, sometimes at any rate, the cause of these painful localizations might be a lack of proper functioning of the joint as the primary cause of the presence of secondary deposits. Until it was realized that such things as sciatica, neuritis, and lumbago did not exist, or that the words meant nothing except that the patient had pain, and that the pain was not a psychological one, they would not get very much further.

Dr. J. B. BURT still thought that sciatica could be divided into three clinical groups: root sciatica, trunk sciatica, and the "referred" group. Dr. LANCELOT WALTON referred to the relief of sciatic pain of the referred fibrous type by manipulation of the lumbar and low back region under an anaesthetic. Dr. P. P. DALTON said that the manipulation of the spine under a general anaesthetic might be dangerous. With the conscious patient warning was given when the manipulation was too vigorous.

Dr. KELLGREN said that in considering the distribution of pain the important thing was the situation of the structure stimulated. Structures situated on the surface of the body such as the deep fascia which lined the limbs or trunk gave rise to pain which was fairly well localized; it was otherwise with structures like the large muscles situated deeply. The term "sciatic pain" was unfortunate. It had, however, the advantage of long usage, and everybody knew what it meant. He would prefer such a description as "pain down the back of the leg" as being non-committal and equally self-explanatory. Recently he saw a case in which pain extended widely down the outside of the leg, following fairly well the distribution of the fifth lumbar vertebra, and which he was able to demonstrate as arising from the deeper part of the capsule outside of the knee. Pain from the inner side of the knee was usually of the fourth lumbar distribution. With regard to the "joint *versus* muscle" argument, it seemed to him that there was no one simple answer. It was quite clear that there were several painful conditions of the muscle quite independent of joint disease, and, on the other hand, a number of conditions of joints independent of muscular disturbance; or the two might be combined in any case in which the origin of the pain was not clear. The cause should be investigated by deciding as clearly as possible from where the pain arose, if necessary by anaesthetizing the structure. In that way clinical experience of a much more accurate kind would be obtained.

The PRESIDENT commented on the number of patients who came with a ready-made diagnosis of "sciatica" which they did not like to be upset. Now that they had to speak of "sciatic pain" instead of "sciatica" it might be more difficult.

A MAGISTRATE ON DELINQUENCY

At the February meeting of the Medical Society of Individual Psychology, with Dr. H. C. SQUIRES in the chair, Mr. CLAUDE MULLINS read a paper on delinquency and psychology.

Mr. Mullins said that our historic methods of trial offended the principles of psychology. Judged by these, there could be no worse method than: (1) Keeping the suspect as long as possible in ignorance of the fact that he was under suspicion. (2) Telling him, as soon as the matter was mentioned to him, that he need make no statement, with the obvious innuendo that it might be worse for him if he talked. (3) Accepting as a general principle that contradictory statements are evidence of lying, thus ignoring the inherently contradictory nature of human personality. (4) Ascertaining the facts by means of a sort of sporting contest in which both sides admitted in fact that a wrong decision of "Not guilty" did not matter. (5) Doing so in a court-room whose construction was so utterly different from the normal surroundings of everyone present that fear was instilled in varying degrees in all concerned. (6) Doing so in the presence of public and Press, the latter being free to publish all names and addresses. These principles were fundamental in our present system, and he would not abandon them, for he was not yet convinced that psychologists could suggest any form of trial in their place which would command public respect.

Had psychology any remedy against persistent lying where the circumstances created every inducement to lie? The criminal courts could ascertain facts, if necessary, without the co-operation of the person concerned. Could psychology claim to do this? Our present system had to be based on the assumption that a large proportion of people would not tell the truth where it was in their interests to lie or be silent. He admitted that present methods, based on punishment, often acted as an inducement to a plea of "Not guilty." He would often like to assure the accused before trial, especially in sexual cases, that if he wished he could safely plead "Guilty," and thus avoid the distress to his victim of a trial. He would like to assure him that he wanted to cure and not punish him. But he could not do this, for until he heard the evidence he did not know the accused's record and had no certainty as to whether he were guilty or not. He could not know, therefore, whether he were a suitable case for treatment. He did not deny that better methods were possible, but psychologists had not yet tackled the problem of criminal procedure in court. If they did there would doubtless be a frigid reception from most lawyers at first, for as a profession they were satisfied almost to the point of smugness. So far psychology had only concerned itself with criminal procedure after sentence, and here a little progress had been made. They must be patient and accept methods and practical ideas of which they could not approve, and hope for progress by evolution.

Except in cases of murder and a few crimes for which minimum penalties were fixed by law, every criminal court could, under the Probation of Offenders Act, 1907, have regard to the character, antecedents, health, or mental condition of the person charged, or to the trivial nature or extenuating circumstances of the offence, and in proper cases avoid inflicting any punishment at all. The offender could be placed under supervision. While it was comparatively rare that probation was used to bring about psychological treatment, the fact was that it had long been legally possible. He had often used the help psychotherapy had to give in an effort to remould offenders. But judicial work made him a realist, and he was often surprised at some of the claims advanced on behalf of psychology. Psychologists would probably benefit by the advice given to a newly appointed judge: "Never give your reasons. Your decisions will probably be right, but your reasons will probably be wrong."

SOCIAL ASPECTS OF ABORTION

At a meeting of the Edinburgh Obstetrical Society on February 8, with the president, Professor R. W. JOHNSTONE, in the chair, Mr. ALECK W. BOURNE read a paper on some social aspects of abortion.

After sketching the historical development of present ideas on the question of abortion, and especially the growth of the Christian view, Mr. Bourne went on to describe the influences which moulded opinion to-day. It was probable that the teaching of the Church was no less strong than formerly within the circle of its adherents, but most people would agree that the radius of that circle was diminishing, and that therefore there was not the same sense of moral guilt as when the teaching of the Church was accepted without question. Not only was the influence of the Church waning, but there was a corresponding increase in the desire for pleasure and indulgence of self. Women wanted more liberty and freedom from the restraints imposed on them by reproduction, and, therefore, pregnancy, after the first or second child, was unwanted. This was followed by a reduction in the sense of reproductive duty instilled into women for generations, while the decay in religious feeling was removing the sense of guilt. The capacity for so-called pleasure had increased, and where a baby conflicted with the enjoyment of what was called a "good time" parents so often could not see that by the sacrifice of the present baby on the altar of a "good time" they were also sacrificing the future interest, happiness, and even protection, which this baby might afford twenty years hence.

Other factors which discouraged multiple child-bearing were the economic difficulties largely caused by the petty snobbery of social comparisons, small flats and houses, lack of adequate domestic help and universal crèche systems, and the threat of war and stress of unemployment. The problem of abortion was linked to that of contraception. If the latter was recognized and encouraged apart from medical sanction, it was an easy, if fallacious, logic to reason that if the conception was the result of a failure of a technique which was not wrong then the destruction of the result of the failure was also not wrong.

The Future

Few people realized that the future of all reproductive problems would be dominated by the threatened disaster of a falling population. Where moral persuasion failed, coercive legislation would ensure every effort towards increasing the number of births. Many still did not realize the extent of the economic distress which would inevitably follow a decline in numbers. When the State woke up to this and to the increasing difficulties of defence the twin questions of contraception and abortion would be considered under the stress of immediate and pressing need. The present law covered most of the ground that could be asked of it, except the single example of child pregnancy following rape and incest, but it was imperative that its operation should be tightened. Illegal commercial abortion should be sought more rigorously, and much so-called therapeutic abortion performed for spurious medical indications must be suppressed by a system of secret notification, semi-official consultation, or other method which would be adopted after careful debate.

How might the prevalence of the illegal operation be reduced? It must be conceded that the bulk of all normal women wish to have children. If, therefore, there was so great a desire to avoid childbirth the reasons which made it difficult must be abolished. The stigma of illegitimacy must be softened or abolished, housing should be sufficiently commodious to make it possible to rear a family in comfort, domestic help should be recognized by the State as an essential of social life and so organized as to be as readily obtainable as any other necessary service, crèche facilities should be made widely available, and greater reliefs of taxation afforded for the larger families. They should not press for any extension of the law to render abortion easier, except in the specific instance already mentioned, but tighten its application against commercial abortion and extend the medical field of indications to cover a number of examples of unfitness to endure child-bearing, which were difficult to define by the name of a disease but which were known to all who practised medicine. By a system of notification or semi-official consultation such true therapeutic abortions would be relieved of all suspicion and of uncertainty as to legal disapproval.

DYSTROPHIA-DYSTOCIA SYNDROME

A meeting of the North of England Obstetrical and Gynaecological Society was held in Liverpool on February 10.

Mr. BRYN WILLIAMS (Liverpool) read a paper on the dystrophia-dystocia syndrome. He introduced his paper by enumerating the characteristics of the syndrome as described by DeLee—namely, diminished stature, adiposity, spade-like hands, diminished menses, often a male distribution of hair, and commonly a contracted pelvis with masculine characters. The pregnancies of these patients tended to go over time, and the babies were often big. In labour uterine inertia was the rule and an occipito-posterior position or transverse arrest of the head was common. He thought that deep transverse arrest of the head was the common cause of these patients' stillbirths, an unfavourable antero-posterior grasp of the head with the forceps being almost unavoidable. He had encountered about sixty patients exhibiting two or more of the characteristics of the syndrome, and he believed it to be commoner than was generally recognized. Labour was always difficult to manage, the more so as many of the patients conceived late in life and their first pregnancy might represent their only chance of a child. Labour was rendered difficult by a combination of post-maturity, relative pelvic contraction, and uterine inertia, and in his experience the inertia did not respond at all well to the administration of oestrin. Instrumental delivery was the rule in these patients' labours, and in many cases Caesarean section was the best method of delivery. On no account should mechanical induction of labour be practised. Provided the existence of the syndrome was borne in mind many of the cases could be diagnosed before delivery and the difficulties anticipated.

Professor FARQUHAR MURRAY (Newcastle) said he did not think the syndrome was as definite as Mr. Bryn Williams had claimed. This view was supported by Professor DANIEL DOUGAL (Manchester), Mr. GOUGH (Leeds), and Mr. J. E. STACEY (Sheffield). Mr. Stacey thought many of these patients had easy labours. Mr. GLYN DAVIES (Sheffield) enlivened the discussion by asking Mr.

Stacey how he delivered his "B.B.A.s." Mr. JEFFCOATE (Liverpool) and Mr. C. H. WALSH (Liverpool) supported the speaker's contention that the syndrome was common, as also did Mr. HERD (Liverpool), who said he had found the administration of oestrin of definite value if it was given for a few weeks before delivery. Mr. MALPAS (Liverpool) said that the syndrome described by Mr. Williams presented many of the complications met with in labour in treated diabetics, and he thought the problem might be closely bound up with the more general problem of the results of disordered carbohydrate metabolism. Some instances of abortion sequences of unknown cause certainly occurred in patients of this type.

At the same meeting Mr. C. H. WALSH showed a coloured film illustrating his method of treating foetal hydrocephalus by transparietal tapping of the foetal skull. Dr. J. W. BURNS showed a specimen of a mixed-celled sarcoma of the uterus. The tumour could only be removed partially, but had since been kept in check by deep *x*-ray therapy. A short discussion was held on the treatment of carcinoma vulvae: Mr. J. E. STACEY discussed the relative results of radium therapy and vulvectomy; Dr. M. DATNOW (Liverpool) showed a film of the radical vulvectomy operation; and Mr. MALPAS (Liverpool) discussed the factors limiting the scope of radium therapy.

TUMOURS OF THE SKULL

At a meeting of the Pathological Society of Manchester on February 8 Mr. G. F. ROWBOTHAM gave an address on the pathology of tumours of the skull.

Mr. Rowbotham said that the osteomas might be grouped as (*a*) those of the vault of the skull, which might be ivory or spongy; and (*b*) those which were paranasal and which might appear with or without complications. The ivory osteoma was slow-growing, and since it rarely projected inwards towards the brain was of little neurological importance. It was composed of compact bone, difficult to saw and difficult to decalcify. Histologically it was indistinguishable from normal bone save for occasional thin layers of membrane bone. The spongy or soft osteomas were diffuse, poorly circumscribed tumours, causing neuralgic pains in the head and encroaching on the intracranial cavity or orbit to compress the brain or to displace the eyeball. They had periods of slow and of rapid growth. Radiologically they threw shadows without details or architectural pattern. Their histological picture was that of bone developing in membrane showing all its phases—some of the pictures very closely resembled that of osteitis fibrosa. No spongy osteoma had ever been observed to develop into an ivory osteoma. This was to be expected, as it was very unusual for a relatively undifferentiated neoplasm to change to a tissue of more adult type—the change was usually the other way.

The paranasal osteomas owed their importance largely to their position. They might grow upwards to compress the brain or to cause the development of an aerocele—a good example of which was demonstrated—or they might grow into the orbit and displace or destroy the eyeball. Structurally they were often made up of an outer coat of hard, dense bone enclosing a core of cancellous bone.

The hyperostoses were discussed in relation to the meningiomas in some detail and were grouped into diffuse tumorous hyperostoses of the vault and base; massive erosions; nodal enostoses; and diffuse non-tumorous hyperostoses of the base—tumorous implying that the bone was invaded by meningioma cells and not that the bone itself was intrinsically tumorous. The root of entrance of the meningioma cells and the reasons for the architectural differences in the bone reaction were also discussed.

At the same meeting Dr. I. A. B. CATHIE read a paper on the sensitivity of malignant tumours to irradiation.

Local News

ENGLAND AND WALES

Mental Hygiene

The twenty-fourth annual report of the Central Association for Mental Welfare relates to the period 1937–8, and contains a useful summary of mental health work in 1937, which indicates, among other things, the still-existing anomalies in regard to special schools arising out of the lack of adequate accommodation for the special education of mentally defective children, even though it is recognized now that the foundations of mental health must be laid in childhood. In that year, however, one valuable advance was the postgraduate course on the teaching of backward children planned for the summer of 1938 by the Goldsmiths' College; with this may be associated the report issued by the London County Council towards the end of 1937 of a special investigation of the question whether in the interests of such children any changes in the organization of elementary schools should be made. It was recommended that experimental classes should be established in some senior and junior schools, and the special training for teachers proffered by the Goldsmiths' College was put to good use. The organization and methods of these classes were illustrated in a report issued in 1938 by the Leicester Education Committee, and the need for further legislation has been made clear so that notification may be made possible of defective children leaving ordinary elementary schools at the age of 14. Late in 1937 the then Home Secretary announced an impending joint inquiry by the Home Office and Board of Education into the question of the relation of juvenile delinquency and dullness. The annual report of the Central Association reveals the great variety as well as the importance of the work in progress, especially on the educational side, and it is noted that this body has found itself now in a position to inaugurate valuable pioneer activities of an experimental character which cannot be undertaken by statutory bodies. The use of standardized mental tests has been much advanced; a fourth holiday home for patients from mental hospitals has been opened, and yet another is being planned to serve the west and south-west of the country. It is to be noted that patients, including epileptics, can be received at the home in Seaford during the winter months either singly or in small parties. At the end of 1937 there were seven full-time occupation centres in the country, organized by the Middlesex County Council. Reports on the community care of epileptics by the Central Association in 1937 include reference to the original Essex inquiry and the succeeding one in which the governing body of the East Suffolk and Ipswich Hospital and the Ipswich Division of the British Medical Association co-operated to produce the first estimate of the size of the epileptic community in any area. Employment has been proved to be one of the epileptic patient's most urgent needs, and also one of the most difficult problems to solve in this age of community care. The existing facilities, at first negligible, are now steadily improving, thanks to the work of the Central Association for Mental Welfare and the various organizations which have been induced to help. The report may be obtained from the offices, 24, Buckingham Palace Road, London, S.W.1.

The Watch over Food and Drugs

According to the annual return for 1937[1] public analysts in England and Wales reported upon 151,370 samples of food and drugs during the year, an increase

[1] Sale of Food and Drugs. Extracts from the Annual Report of the Ministry of Health for 1937–8 and Abstracts of Reports of Public Analysts for 1937. H.M. Stationery Office. (4d.)

of 4,932 on the number of the previous year. Of these, 5.5 per cent. were found unsatisfactory. One sample of milk was shown to contain six parts per million of formaldehyde. Legal proceedings were instituted and a fine of £15 with £5 costs was imposed. Two samples of cream also contained formaldehyde. Of 561 samples of beer examined, thirty-one were adversely reported upon. Twenty-seven samples (of which nineteen were taken by one local authority) were stated to be contaminated with lead. Lead contamination was also demonstrated in several instances in canned fish, chiefly sardines, while a considerably larger number of samples of canned fish, in addition to canned fruits, vegetables, and soups, received adverse reports on account of tin. Copper was found in one sample each of cider, mincemeat, tomato soup, sweets, celery, sauce, and yeast extract, while arsenic was reported in samples of apples, grape juice, gelatin, and confectionery. With regard to drugs, of 6,695 samples examined 340 were found to be adulterated or not up to standard. Fourteen samples of ammoniated tincture of quinine were deficient in ammonia; ten of camphorated oil were deficient in camphor, and one of these was also stated to contain chiefly petroleum instead of olive oil. A sample of linseed meal was deficient in oil and contained hard woody tissue, paper, and maggots.

Medical Reports on Mental Patients under Matrimonial Causes Act

In view of the fact that in many instances of litigation concerning patients at mental hospitals, particularly in cases under the Matrimonial Causes Act, 1937, medical reports are required and are furnished by the council's medical officers, who are sometimes summoned to attend court as witnesses, the Mental Hospitals Committee of the London County Council proposes that the supply of such reports and the attendances of officers at court shall be subject to conditions and payment of fees as the committee may prescribe.

Chadwick Lectures

The following public lectures have been arranged by the Chadwick Trust (204, Abbey House, Westminster, S.W.): February 28, at 26, Portland Place, W., Professor Major Greenwood, F.R.S., "Occupational and Economic Factors of Mortality"; March 14, at Royal Sanitary Institute, 90, Buckingham Palace Road, S.W., Dr. J. B. Howell, "The Preservation of Child Life"; April 4, at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C., Bossom Gift Lecture by Mr. W. R. Davidge, "Evacuation Centres and Holiday Camps—Temporary or Permanent Forms of Construction"; May 16, at the Royal Institute of British Architects, 66, Portland Place, W., Mr. G. H. Henderson, "Comparative Study of the Housing of the Working Classes, with Special Reference to Scotland"; June 15, at the Chelsea Physic Garden, Swan Walk, S.W., Professor R. Ruggles Gates, F.R.S., "Plant Genetics and Human Welfare." All the lectures begin at 5.30 p.m.

CEYLON

The Anti-malaria Campaign

The campaign against malaria in Ceylon continues with increasingly good results. In his administrative report for 1937 Dr. S. T. Guneskara, the director of medical and sanitary services for the island, stated that in that year the number of admissions to hospital was 57,190 as against 73,192 in the previous year and 161,313 in 1935. The number of cases treated in dispensaries fell concurrently, and there is a steady fall in the death rate from this cause. Malaria is still, however, the most prevalent disease in the island. The campaign against it, which began in the latter part of 1936, was extended during 1937 to include the whole of the north-western province, the Matale and Kandy districts of the central province, and several other areas. There is now a closer control of protected water supplies and of soil pollution generally. The construction of wells in rural districts remains a serious problem. It has been found that when village committees dig wells with the aid of their own funds they prefer to allocate them for bathing rather than for drinking purposes. Until an adequate supply of wells for drinking purposes shall have been provided the inhabitants are being taught to boil all drinking water. In the course of the year under review 5,545,525 5-grain tablets and 19,091 lb. of quinine were issued free of charge for curative and prophylactic purposes. The special anti-malaria measures being prosecuted in various parts of the island are described in detail by Dr. Guneskara. They include the cleansing and refilling of known breeding places, and the routine oiling of all such places other than the drinking-water supplies and paddy fields. Attention is being given to drainage and the removal of weeds and debris from pools and stagnant water generally. The supply of "millions"—the mosquito-devouring fish—has proved effective in various places, while quinine prophylaxis is systematically employed for school children and general labourers. Spleen and parasite surveys have been conducted in many places. The total rainfall in 1937 was 63.66 inches in Chilaw, which was heavier than in any of the four previous years, rendering the problem of mosquito control more difficult. Herbage packing of six borrow-pits was tried as an experiment to prevent anopheline breeding, and was successful, but culicines continued to breed rapidly nevertheless, and the cost of this measure prevented its continuance. Lectures were given to field medical officers at Colombo on malaria epidemiology and control, and periodical conferences were held. At the central office and laboratory in Colombo the life-history study of malarial parasites in the human blood is being continued with a view to determining the seasonal prevalence of the human plasmodia in different parts of Ceylon; the proportional distribution of the three species as a whole in regard to the zones of inquiry and by months in the island; the increase (if any) in parasite infestation during the non-transmission season; determination of the time best suited for quinine distribution in schools; and the correlation of spleen sizes to parasite findings and fever histories. Another investigation has been started to define the percentage error in the clinical diagnosis of malaria at out-patient departments. The spleen rate for the whole island in 1937 was 28.3 compared with 30.6 in 1936.

The invitation of the President of the United States to participate in the tenth International Congress of Military Medicine and Pharmacy, to be held in Washington from May 7 to 15, 1939, has been accepted by thirty-five countries. Nearly one hundred medical officers of high military rank have been indicated through diplomatic channels as official delegates from their countries. Registration is open only to medical and pharmaceutical officers, active or retired, of the armed forces and related branches. Official delegates must be accredited by their Governments. The New York office of the congress will be located in the Waldorf-Astoria Hotel, and delegates and members arriving in New York will be met by a reception committee which will afford them every possible aid, such as clearing the Customs at the port, interpreting when necessary, arranging visits to the World's Fair, etc., and securing hotel reservations and transportation to Washington. Detailed information will be furnished upon request by the Secretary-General, Tenth International Congress of Military Medicine and Pharmacy, Army Medical Library, Washington, D.C. The American Express Company, travel representatives of the congress, will furnish data on the passport requirements, steamship and railroad rates, etc., through its branch offices.

Correspondence

Blood Transfusion in Obstetrics

SIR,—I have watched the advocacy of blood transfusion and its increasing application in obstetrics during the past few years, and am further than ever from being persuaded that it has any useful place. In treating haemorrhage connected with obstetrics one dictum should be laid down and followed before all others, *Stop the bleeding*. In cases of active abortion and retained placenta the emptying of the uterus will always effect this; in placenta praevia the uterus cannot be emptied immediately, but the bleeding can be stopped temporarily and the subsequent obstetric management should be such that any further inevitable loss is strictly controlled.

When the primary bleeding has been stopped it is essential to restore the volume of the blood supply. I cannot agree with Wentworth Taylor that there is any disadvantage in doing this early or by the intravenous route. I prefer that route to the submammary, but I can see his point that rectal or submammary is simpler if one is working short-handed. If I have sufficient assistance I would like to initiate the intravenous infusion while I was personally dealing with the obstetric part of the case, but this is beside the issue.

Stallworthy cites four cases; to me they prove nothing. Of the three that were not transfused one was so extreme that the patient never rallied after the bleeding was stopped; it seems doubtful if transfusion could have been carried out in time. In the second case the patient responded well after 100 c.cm. of fluid; the treatment of the depletion was never effected or maintained. In the third case no effort seems to have been made to treat the depletion. The patient who recovered after transfusion ceased to bleed, was given saline, and during the next twenty-four hours received eighty-two ounces of fluid, which happened to include two pints of blood. The 30 per cent. haemoglobin content of the blood is absurd; there is no reason why the blood immediately after a profuse loss should show a low haemoglobin content before the full volume was made up, and if the volume was made up the 30 per cent. would be compatible with survival.

Now if we take one of the reports from which Stallworthy says the unfortunate cases might be multiplied many times we can get the following. During the year twenty-four cases were treated by blood transfusion. Five were cases of abortion, with no deaths. There were 383 other cases of abortion treated in the hospital with eight deaths, but not from haemorrhage; three deaths were due to toxaemia and the other five to frank acute sepsis. Little in the way of conclusion can be drawn from this, but nothing in support of blood transfusion. Seven cases of placenta praevia were given blood, and the patient in one of these died. She was given sixteen ounces of blood, continued to bleed, a foot was brought down, and death occurred just when a second transfusion was started. There were sixty other cases of placenta praevia treated, with three deaths. Thus the mortality is respectively 14 per cent. and 5 per cent. for the cases with and without transfusion.

It may be said, of course, that the worst cases were those that were transfused, but on looking through those cases it is seen that the condition of the patients is described as fair, blanched, pallid, one poor, and one very ill. The pulse rates were 72, 132, 100, 112, 98, 112, 140. Among the sixty cases there were twenty variously described as fair, one very blanched, three anaemic, two pallid, one poor, and the pulse rates ranged from 76, including 120, 128, 132, 136, 140, 160. From the physical signs, therefore, there is little to differentiate the groups. Of these twenty patients only two died. Thus there is a mortality of 10 per cent. in the cases not transfused as against a mortality of 14 per cent. in those given blood. The condition of one of the patients who died without transfusion was described as good; her pulse was 80, and she died after Caesarean section. I think it will take more convincing statistics than these, when the individual cases are examined, to establish the claim that blood transfusion will reduce the maternal mortality from haemorrhage in comparison with the results obtained by prompt and efficient obstetric treatment.—I am, etc.,

Dublin, Feb. 16. GIBBON FITZGIBBON.

SIR,—There is an unfortunate tendency nowadays to advocate the more complex form of treatment in cases in which the simpler method has proved extremely successful. Mr. John Stallworthy (*Journal*, January 28, p. 153) pleads for a "freer use of blood transfusion in obstetrics" in cases following blood loss, but he does not show the advantages in these particular cases of the use of blood over saline. He quotes from hospital reports three fatal cases in which blood transfusions were not given, but I think it is fairly obvious that, as Mr. Wentworth Taylor hints (February 4, p. 242), the amounts of saline administered were quite inadequate. With sudden severe haemorrhage the heart's action tends to become disordered through its lack of a sufficient volume of fluid on which to contract, and fibrillation may thus supervene. The anoxaemia is of secondary importance only. After five years of hospital experience as a resident I am convinced that the simpler fluids will save any patient who can be saved. I have never seen one die from haemorrhage. The necessary apparatus is always convenient for use by nurse or house-surgeon. The oral route should not be entirely neglected if the patient can swallow. Although the pundits may say that fluid is not absorbed from the stomach in the ordinary way in any quantity, the poor "G.P.," answering an urgent and perhaps an unspecified call, knows its rapid restorative action when, having first of all stopped the bleeding, he very rightly adopts perhaps the only means at his disposal of increasing the blood volume. May I set out the following case against Mr. Stallworthy's selected cases.

On arriving back on duty in a hospital near London at 12.30 a.m. I met the medical superintendent leaving the labour ward. The woman, he said, was *in extremis* and would die in a few minutes. I will say this only—that haemorrhage had been severe and that forceps had been applied without success. Her face was purple, fingers blue, and skin cold. The pulse at the wrist was imperceptible. The pupils were dilated, and she was noisily fighting for breath, with mouth wide open and chest heaving. Though conscious, she was unable to speak to her husband at the bedside. Before the superintendent left the building I got his permission to give some saline. She did not feel the incision, and in a minute she was having normal saline intravenously. The first two pints or so were given rather rapidly, and the extreme air-hunger began to improve a few minutes later. The saline was continued at a rate approaching the orthodox, and in fifteen minutes the pulse was perceptible and rapid and the breathing easy. Bleeding (from a marginal placenta) did not recur. At 3 a.m. not less than eight pints had been given, and she was sleeping so peacefully that I did not withdraw the cannula or suture the wound. The dead foetus was removed at 10 a.m., and her condition was then good. She was able to go home three weeks later.

This was an exceptional case in many ways, but it certainly demonstrated the efficacy of increasing the content of the cardiovascular system. I feel that the pints of rectal and subcutaneous saline so often given by the nursing staff before the blood donor arrives account for the salvation of many. The whole blood, if given later, may then be beneficial by virtue of its haemoglobin content, etc. I believe that the value of blood transfusion is greatest in the septic wards, where it is often the means by which the whole outlook is changed in twenty-four hours. The worst complications in cases of puerperal sepsis may respond; and the infection in those terrible cases of rapidly spreading cellulitis, for which amputation is still sometimes considered, may be overcome and localized. I cannot finish without congratulating Dr. E. K. Mackenzie (February 11, p. 299) on his very sane views about the "mechanization of medicine" and the treatment of the "pre-eclamptic" patient.—I am, etc.,

Lurgan, Co. Armagh, Feb. 13. G. J. RYAN.

SIR,—The letters from Dr. Bethel Solomons and Mr. Arthur Crook in your issue of February 11 (p. 298) in support of the use of salines in the cases of emergency due to severe acute haemorrhages reopen a subject of the greatest importance in these days, when so much work is being done on the value of blood storage as a practical measure of therapeutics. There is a possibility that unless those in a position to speak with authority give us a very clear exposition of the relative value of blood transfusions and of intravenous salines and gum salines, and of the special indications for the use of each, not only may there be a wastage of good donors' blood but also loss of life which might be averted.

I venture to offer certain conclusions which I have arrived at as the result of personal observations, in the hope that they may at least provoke further expressions of opinion and possibly be of some use to others who have had even less opportunity of forming an opinion than I have had. In cases suffering from the effects of sudden great loss of blood the body endeavours to restore the volume of fluid within its vessels by drawing very heavily on the fluid in the tissue spaces. These cases revive astonishingly quickly if sufficient normal saline, preferably with 5 per cent. glucose added, is given fairly rapidly intravenously. I have given as much as 2,000 c.cm. in an hour not infrequently, with the happiest results.

It is well known that not much more than 500 c.cm. of gum saline can be given at once without causing embarrassment to the enfeebled cardiovascular system, and the same quantity of blood is usually as much as it is wise to administer at once. Now gum saline is a colloidal solution specially designed to remain within the blood vessels, and its use was probably invoked originally because it was observed that sometimes an ordinary normal saline infusion will be quickly excreted by the kidneys, and this phenomenon was not correctly evaluated. In order to obtain some first-hand information on this point I have observed the amount of urine passed by these patients during the twenty-four and forty-eight hours following large saline infusions. I was not surprised to find that in those cases in which there was known to have been a very large loss of blood and the patient had been restored by the rapid infusion of three or four pints of normal saline and 5 per cent. glucose there was only a normal 30 oz. of urine excreted in the following twenty-four hours, whereas in those patients who were received in a very collapsed state after haemorrhage, the exact amount of which was not known, if a large saline infusion was given as a restorative, then in the next twenty-four hours there was often a profuse diuresis.

This suggested that a more careful differentiation between the collapse due to simple excessive loss of blood and the collapse due to shock was necessary if we were to avoid drowning some of our patients with excessive salines and denying to others that very liberal donation of fluid which seemed so efficacious. It is, of course, to the shocked type of case that a pint of gum saline infusion, or a pint of blood, is of so much value because it remains in the dilated arterioles and capillaries and so maintains blood pressure. But to the acutely exsanguinated patient who has drawn heavily on her tissue fluids one pint of gum saline or of blood is often inadequate. A series of cases of ruptured ectopic gestation, and one in which the spleen had been ruptured ten hours before laparotomy, afforded the material upon which these opinions are based. It was found that in some cases of ruptured ectopic pregnancy the severe collapse of the patient was out of proportion to the amount of blood lost, and that it was only dangerous to give them a large infusion. The case of ruptured spleen, on the other hand, was extremely exsanguinated, and the glucose saline infusion, started in the operating theatre before beginning the operation, was continued throughout the operation and after it before returning the patient to the ward until 2,000 c.cm. had been taken; within one hour of this volume of fluid a further 500 c.cm. of blood was given slowly, and even after this large total the patient had no distress or diuresis in the following forty-eight hours.

In my own small experience cases suffering from the effects of sudden and severe haemorrhage actually did better with the administration of large quantities of saline intravenously fairly quickly than with the maximum volume of either blood or gum saline which could be safely administered in the same time, and it appeared that a blood transfusion was of greatest value in cases of chronic or repeated haemorrhage where there was no lack of body fluids but rather an exhaustion of the body's reserve of iron and powers of haematopoiesis.—I am, etc.,

London, Feb. 15. R. W. NICHOL.

SIR,—In answer to Professor A. M. Claye's letter (February 18, p. 359) I would only say this: I tried in the small space of my previous letter to hint at the real "villain of the piece" in cases of post-partum haemorrhage—namely, separated placental tissue. It is in respect of this element that post-partum haemorrhage differs from haemorrhages in other locations, or in males. When the placenta separates, Nature provides that retraction of the uterine muscle shall cut off the flow of blood at the "main." If separation is but partial, bleeding continues, and Nature again steps in by lowering the blood pressure as a whole, and, in addition, arranges that the blood pressure shall remain at this low point until the placenta is removed. The danger point is shifted at this stage to the higher centres. It is precisely at this point that the danger of giving transfusions arises. When the placenta has been removed the cardiovascular system responds in direct proportion and speed to the length of time it has been under the evil influence (depressor) of separated placental tissue.

The giving of transfusions to shocked patients before the removal of the placenta will continue, in my humble opinion, to provide comfort for the transfusion-minded; it will also continue to provide mortality. I am glad that Mr. John Stallworthy has brought up this matter. The

drip method which he advocates is as near safe as can be, and is perfect once the "cause of the continued low blood pressure has been removed." In conclusion, I can give my own mortality figures from post-partum haemorrhage since 1932: Total deliveries, 8,489; deaths from post-partum haemorrhage, 4. Dr. Bethel Solomons has given a series of

Placenta praevia	138 cases; 2 deaths
Ectopic pregnancy	214 cases; no deaths

Let Professor Claye now examine the mortality tables from the latest reports coming from maternity hospitals all over the country.

In them he will find individual reports returning as many as five deaths in a single year, almost all with one factor in common—namely, an immediate transfusion of saline, gum saline, or blood. My only connexion with Dr. Solomons is that I was privileged to be his "transfusion-minded" assistant at the Rotunda Hospital. I still give transfusions with benefit to my patients, but I am careful not to transgress the now unfashionable dictum of "masterly inactivity" until warmth, ephedrine, morphine, rectal saline, and complete rest have collectively given the "all clear."—I am, etc.,

Birmingham, Feb. 19. WENTWORTH TAYLOR.

Treatment of Eclampsia

SIR,—In the correspondence on this subject attention has, not unnaturally, been concentrated on the immediate interests of mother and child. I suggest, however, that consideration must also be paid to the more remote effects on the mother's health. I see a good many of these cases during pregnancy in consultation with obstetricians, and I have endeavoured to keep as many as possible under observation subsequently, and I believe that the methods advocated by Dr. Rufus C. Thomas (*Journal*, January 28, p. 188) will in the majority of cases save the mother from permanent damage to the cardio-renal system and give her a reasonable expectation of longevity. The excellent immediate results quoted by Dr. E. K. Mackenzie (February 11, p. 299) are a tribute to his skill and care; but I believe that when a woman is allowed to continue to term with a persistently high diastolic pressure there is a grave risk that she will have sustained permanent damage to her kidneys and is likely to have a greatly reduced expectation of life. Dr. Mackenzie's patient who, five years after confinement, had a pressure of 174/98 mm. Hg with symptoms of hyperpiesis is an example of how many such cases develop, and the mortality rate after ten years would certainly be found to be greatly in excess of the "expected mortality." It must be borne in mind that a woman of 30 has an "expectation" of thirty-five years; are we justified in adopting an attitude of complacency because she is alive and apparently fairly well after five, or even ten or fifteen, years? Apart from the immediate treatment of these conditions, I consider that a woman who has manifested a raised blood pressure and albuminuria during pregnancy should be urgently advised not to have any further children. If contraceptive measures fail and she develops similar signs in a subsequent pregnancy, sterilization should be advised.—I am, etc.,

London, W.1, Feb. 16. T. W. PRESTON.

Treatment of Sterility

SIR,—In reply to Mr. Albert Sharman's letter in your issue of February 4 (p. 243) it is true that seven of the twenty-two patients who became pregnant miscarried, but of these seven two became pregnant again within two months and are now seven and eight months pregnant respectively, so that the ultimate viability rate was 27.4 per cent. It is probable that if hormonal therapy had been given throughout pregnancy in all the cases which miscarried the viability rate would have been higher.

Mr. Sharman asks whether the twenty-six patients who had lipiodol injection and no hormonal therapy were given (1) advice as to the most opportune time of intercourse, or (2) advice, when discharge was present, to syringe with a solution of bicarbonate of soda, or (3) vitamin E. With regard to (1) advice was given in every instance; (2) an alkaline douche was not resorted to; and (3) vitamin E was not given in any case in this series; so that with the exception of those patients who became pregnant as a result of advice given under (1), the statement "50 per cent. success can be attributed to lipiodol injection alone" holds good.

In the series of sixty-two cases quoted no attempt was made to perform premenstrual endometrial biopsy, but this has since been done in four of the patients who did not become pregnant and a secretory stage (confirmation of ovulation) found in every case. I have been led to understand that the V.B. test (urinary excretion of sodium pregnandiol glucoronidate: Venning and Brown) is only of conclusive value if the daily excretion throughout the luteal phase is taken, as the output may vary from day to day. Since many of the patients come from outlying parts of London expense has been a consideration, and my investigations therefore have not been as thorough as they might have been.

Mr. Sharman compares kymographic insufflation favourably with lipiodol injection, but my efforts by this method have not given me conclusive evidence and the sequelae following lipiodol injection have not been such as to contraindicate its use. I have to date performed 120 lipiodol injections, with subsequent pelvic pain and pyrexia in two instances. The case I quoted had suspected pelvic sepsis, but recent insufflation has revealed patent tubes on both sides, so presumably this was of a mild degree. In the second case, which occurred since my report was written, a unilateral salpingitis developed, but this appeared to be a recrudescence of a pre-existing infection, since salpingography revealed blocked tubes. I am glad to learn of the new radio-opaque substance produced by Titus and his associates, and shall give it a trial.—I am, etc.,

London, W.1, Feb. 15. MARGARET MOORE WHITE.

Intussusception Protruding through Anus with Inversion of Appendix

SIR,—The case of inversion of the appendix described recently by Mr. Corcoran incites me to tell of a somewhat similar but more advanced condition which I was fortunate enough to meet two years ago.

The patient, a boy aged 11, Gibraltarian, was admitted with a history of colicky abdominal pain, diarrhoea, and incontinence of faeces for seven days, with two weeks of vague malaise previously. He was undersized, underfed, and emaciated, and obviously extremely ill. Attacks of colic occurred frequently, with incontinence of small amounts of faeces. The abdomen was distended, but rigidity or tumour was absent excepting for a very full bladder (almost complete retention being present). Rectal examination revealed the apex of an intussusception just beginning to distend the anal sphincter but not yet appearing externally. While pre-operative treatment and preparation were being administered the mass suddenly protruded through the anus for three inches, and a short blind diverticulum was then seen attached to the protrusion. This was two inches in length, acutely inflamed, and almost gangrenous, arising from the main mass near the apex on the left side and strongly resembling an acutely

inflamed appendix as seen in more common circumstances. This or a Meckel's diverticulum, completely inverted, was the obvious interpretation.

At operation an assistant reduced the prolapsed portion, pushing it up the rectum until the apex could be seized from within the abdomen. The whole length of the intussusception was then reduced, not without some difficulty at the terminal part, which appeared to be the ileo-caecal valve. The diverticulum, which proved to be the appendix, completely inverted, was only partly reducible, so was excised with a small surrounding area of caecal wall.

Recovery was uneventful, the patient being fit on discharge; there has been no recurrence of the intussusception during the succeeding two years.

Points of interest in the case are the age of the patient, slow development of the intussusception (apparently seven days), and presentation outside the anus of caecum and inverted appendix. It is a point for argument whether the inflammation of the appendix was cause or effect of the intussusception. The probabilities seem to favour the former.—I am, etc.,

K. J. GILCHRIST, M.B., F.R.C.S.

Colonial Hospital, Gibraltar.

Direct Inguinal Hernia

SIR,—I have read with great interest Mr. W. G. Gill's article in your issue of February 11 (p. 263). I have met the type of direct inguinal hernia he describes in one case out of a series of 205 personal operations for inguinal hernia of which I have notes.

The patient was a man aged 26, who was seen in October, 1934. He had noticed the hernia one week previously. Clinically the condition was a left indirect inguinal hernia and was controlled by thumb pressure over what was considered to be the internal abdominal ring. At operation on January 7, 1935, a very small indirect sac was found. It was transfixed, ligatured with silk, and excised. The cord was not displaced, as is my usual practice for early indirect hernia, and the wound was closed. He returned the following month with a similar condition, which was then diagnosed as a small direct hernia. At the second operation, on March 4, a small direct sac was found bulging through a well-defined circular opening in the transversalis fascia. In all respects it resembled an indirect sac except that there was a small mass of extraperitoneal fat at the fundus and the neck was medial to the deep epigastric vessels. The neck was readily transfixed and ligatured and the sac excised. Living fascial grafts from the fascia lata were employed to close the opening in the transversalis fascia and to strengthen the posterior wall of the inguinal canal.

Mr. Gill points out that the aetiology of this type of direct inguinal hernia is not clear. All surgeons are familiar with the fascia which suspends the cord from the inguinal canal and which has to be perforated in order to mobilize the cord. In my opinion this fascia is in reality a mesentery, which is derived from the transversalis fascia which forms part of the posterior wall of the inguinal canal. This mesentery surrounds the cord as the internal spermatic fascia and its root runs from the internal abdominal ring, with which it is continuous, towards the pubic spine. When the mesentery is perforated a potential weakness is produced in the transversalis fascia through which extraperitoneal fat can bulge, and later peritoneum. In Mr. Gill's drawing this mesentery is not depicted and the cord and sac are shown unconnected. Clinically the resemblance to an indirect hernia is very close, and I believe this is due to the fact that this direct sac is a hernia into the root of the mesentery of the cord, and is therefore also enclosed by the internal spermatic fascia and guided by the cord towards the external abdominal ring, and, as Mr. Ogilvie has stated, often emerges through it. If in performing a radical cure for early indirect inguinal hernia the mesentery of the cord is perforated it is essential to repair the transversalis fascia or to cover the defect with some other structure.—I am, etc.,

London, W.1, Feb. 13. CAMERON MACLEOD, F.R.C.S.

Fracture of the Olecranon

SIR,—I was most interested in Mr. Naughton Dunn's article on this subject in the *Journal* of February 4 (p. 214) and in Mr. Ernest W. Hey Groves's letter (February 11, p. 296), but was surprised that neither of these authorities mentioned a third method of treating certain of these fractures—namely, by fixing the olecranon with a screw, a method which I have personally employed whenever practical.

The operation is performed through a vertical, curved incision at the side of the olecranon, so as to avoid an adherent scar on the point of the elbow. The opposing fractured surfaces are cleared of blood clot and debris and carefully fitted together. The triceps tendon is then split vertically for about one inch to expose the top of the olecranon, and a hole to receive the screw drilled vertically downwards, passing across the line of fracture into the shaft of the ulna. The fragments are then screwed together, using a stainless steel screw at least two inches long. The head of the screw is automatically buried when the split in the triceps tendon is approximated.

This very simple operation has the great advantage that the fixation is so rigid that active use of the elbow can be safely permitted within a few days of the operation, and gives such satisfactory results that I feel that the method of excision of the proximal fragment, advocated by Mr. Naughton Dunn, should be reserved for those cases where it is so small that efficient fixation becomes impossible. In such cases, also, the loss of mechanical advantage to the triceps, mentioned by Mr. Hey Groves, would be minimal.—I am, etc.,

London, W.1, Feb. 13. T. T. STAMM.

Normal Temperature 99°?

SIR,—The following notes on a patient of mine, a healthy-looking girl of 20, may be of interest in view of the fact that her normal temperature seems to be between 99° and 99.6° F. There is no question of deception, because I have taken the temperature on several occasions myself, and have had her under observation for long enough before taking it to exclude the possibility of her (for instance) taking a hot drink; moreover, she is a very sensible person, and most anxious to lead an ordinary natural life, free from the restrictions that one generally imposes on a person with a temperature of over 99°. Her medical history is as follows.

June, 1934.—Acute appendicitis: appendicectomy.

April, 1935.—Tonsillectomy.

June, 1935.—"Sinus and ear trouble." This was apparently an acute right maxillary sinusitis which settled down. At the same time she had reflex earache, but apparently no otitis media. Recovery was complete (the temperature returning to normal), and in November of the same year she entered hospital as a probationer nurse.

July, 1936.—Caught a cold and developed acute otitis media. Myringotomy performed; no pus. Recovery normal, but complained of occasional earache.

December, 1936.—Second attack of otitis; myringotomy; much pus evacuated.

January, 1937.—Purulent otitis persisted; conservative mastoidectomy performed, the condition eventually completely clearing up. The temperature, however, did not come down, but stayed between 99° and 100°.

January 24.—Returned home. Temperature still between 99° and 100°. Complained of backache: massage relieved

this considerably. The temperature persisted throughout the year, during a large part of which she was kept completely at rest in bed. She had no symptoms or other signs, and felt quite well.

December, 1937.—Slight attack of catarrhal jaundice. Recovery rapid.

January, 1938.—Went to Switzerland (still with raised temperature) complaining of occasional backache.

April.—Chicken-pox. Recovery rapid, though temperature still up.

June.—Entered a clinic at Montreux, where she had twelve intravenous injections of "septicemine cortial." Temperature normal after three of these.

July 2.—Greatly encouraged, she returned home.

I was called to see her for the first time on July 24, 1938, when she had a right frontal carbuncle, which was intensely painful. Her temperature varied from 99° to 100°, and for a week she was confined to bed. The carbuncle cleared up under ordinary treatment, but even after apparently complete recovery the temperature did not settle. Every evening it rose to 99.4° or 99.6°; in the morning it fell to 98° or below. I have had the following investigations carried out:

X-ray of Chest.—Normal appearance: no sign of infiltration.

Examination of Ears, Nose, and Throat.—No sign of a septic focus. A radiograph of the sinuses showed no abnormal shadow.

Bacteriological Examination of the Urine.—The urine was sterile.

Blood.—Haemoglobin, 92 per cent.; leucocytes, 7,500 per c.mm.: polymorphs 62 per cent., lymphocytes 36 per cent., eosinophils 2 per cent. The sedimentation rate (West) was 6 mm.

The pulse rate is 80, and her temperature, every evening, is over 99°. Her weight is 8 st. 10 lb.: she is well covered, and is in fact gaining weight.

I think that, in view of the girl's appearance and feeling of fitness, and in view of the results of the investigations, the only possible conclusion is that her normal temperature is 99.6°.—I am, etc.,

Cambridge, Feb. 11. EDWARD BEVAN, M.B., B.Ch.

Milk and Asthma

SIR,—In the *Journal* of February 4 (p. 247) Dr. H. Gordon Oliver, in criticizing my remarks about the evil effects of milk in causing asthma, attributes these effects to monilia in the milk. He omits reference to my statement that hot milk may be even worse than raw milk. At least in many cases heating would kill monilia spores, which are far less resistant to heat than those of anthrax. A patient of mine who regularly took hot milk had asthma and urticaria for six years. That was stopped, and on detoxicating and other treatment she has had no asthma for nineteen years. She can now take milk. Dr. T. Gow Brown, bacteriologist for Lanarkshire County Council, has for the last ten years examined the deposits in about 2,000 specimens of milk annually, and has never found monilia, though he has often found it in sputum. At my request he has lately examined, using cultural methods, forty consecutive specimens of milk, and has not found monilia once. There are other reasons against accepting monilia as the cause of asthma—such as the week-end periodicity of attacks in asthmatics who take milk—but there is no need to waste space. Whatever monilia does in Jersey it is not a fertile cause of asthma in Lanarkshire.—I am, etc.,

Glasgow, Feb. 14. JAMES ADAM.

Transmission of Syphilis

SIR,—The article by Dr. J. A. W. McCluskie in the *Journal* of February 11 (p. 264) on the transmission of syphilis by blood transfusion, with its insistence on the infectivity of the blood in the incubation stage of syphilis, prompts me to put forward another intimately related fact—namely, the infectivity of the semen in the incubation stage of syphilis. It was first brought to my notice through the occurrence of an innocent extragenital infection in a married man, whose wife was found later to have a primary chancre of the cervix. It is therefore a point of some importance to surgeons, obstetricians, and dental surgeons in their own family lives. Since then I have had numerous instances of seminal infections occurring in the incubation stage. The following is a clear-cut case.

On December 15, 1937, a male patient aged 47 was found to have primary sero-negative syphilis (dark-ground examination—*Spirochaeta pallida* present; blood Wassermann reaction—negative). There was a history of illicit intercourse about one month before and marital intercourse three weeks before the appearance of the ulcer. His wife reported and was examined twice weekly, and had a Wassermann test once weekly. On February 14, 1938, primary lesions were found at the fourchette and on the anterior lip of the cervix (dark-ground examination—*Spirochaeta pallida* present; Wassermann reaction—negative). On February 16 no signs of the ulcers were visible. No treatment whatsoever had been given.

This case demonstrates (1) infectivity of the male during the incubation period, as there had been no intercourse since November; (2) a long incubation period of eleven to twelve weeks; and (3) the occurrence of evanescent primary lesions. The wife was at the climacteric, was exceedingly afraid and frigid, and corroborated the fact that the last intercourse had occurred in late November. So greatly have these cases impressed me that I am quite convinced that syphilis is transmitted as a general rule by the natural secretions from mucous surfaces (semen, cervical and uterine mucus, saliva, and breast milk), especially in the first two years after infection. The semen is probably infectious from the end of the first week until five years after infection, while the other secretions become dangerous in the early secondary stage. Venereal infection from open ulcers is comparatively rare.—I am, etc.,

Liverpool 1, Feb. 15. A. O. F. ROSS.

Copper and Cobalt in Iron-deficiency Anaemia

SIR,—In a letter in the *Journal* of February 11 (p. 297) Dr. J. P. McGowan refers to recent work carried out here on the use of cobalt in controlling the nutritional anaemia of sheep known as "pine disease." He contends that these results do not necessarily show, as a lecturer recently stated, that a deficiency of cobalt in the food is the cause of the disease. As one of the authors of the paper referred to (Corner and Smith, *Biochem. J.*, 1938, **32**, 1800) I should like to make it clear that no claim was made that a deficiency of cobalt was actually the cause of the disease. The matter was left open because it was recognized that existing knowledge does not allow any dogmatic interpretation of the results.

It is quite possible that the underlying cause may be found elsewhere than in a deficiency of cobalt. The part played by the various elements which promote the utilization of iron in the body is little understood, and it may well be that cobalt has been of value in the present case because of a breakdown in the metabolism of some of

the better-known elements. Nature may sometimes provide a second string. I may say that this particular disease in sheep is widely distributed in this country, and evidence is accumulating to show that in the different areas affected the condition can likewise be controlled by the use of cobalt.

Since the above results were established I have administered traces of cobalt, without any iron supplement, to many hundreds of sheep in different stages of anaemia and have invariably got a response. If similar work has not already been done in the medical sphere it might perhaps be useful to try the effect of cobalt on certain forms of nutritional anaemia in the human subject.—I am, etc.,

Edinburgh and East of Scotland College of Agriculture, Feb. 14. H. H. CORNER.

Treatment of Thoracic Deformities by Mechanical Respirator

SIR,—Much has been written on the use of mechanical respirators in the treatment of infantile paralysis and of certain lung diseases. I have seen no mention, however, of their possible application in the treatment of deformities of the chest and spine. When all hospitals have received a respirator from Lord Nuffield's scheme it would then be practicable to try out the following method on a large scale. In Brighton we are fortunate in having an efficient respirator at the municipal hospital, and Dr. S. J. Firth, the medical superintendent, has kindly offered to co-operate with me in the treatment of these deformities.

The principles of treatment, for example, in scoliosis would be twofold: first, to apply compression in the long diagonal axis of the chest, and, secondly, to increase the mobility of the flattened ribs. The former could be achieved by a corrective plaster jacket with appropriate pads and windows, and the latter by placing the patient in the respirator for a suitable time—say, half an hour daily at the commencement of treatment, working up gradually to a longer period. The treatment of other deformities, such as kyphosis, pigeon-chest, etc., could be tackled on similar lines. Any practical suggestions would be greatly welcomed.—I am, etc.,

Hove, Feb. 2. J. M. TURNER, F.R.C.S.

Skin Protectives

SIR,—I cannot too strongly commend Dr. P. B. Mumford's investigations in the search for an ideal skin protective (*Journal*, February 11, p. 266).

There is one point I would like to raise. Many solvents and chemicals in use to-day are absorbed through the skin. In these cases the skin protective should fulfil a double function: (*a*) reduce the incidence of industrial dermatitis, and (*b*) prevent skin absorption. In the case of chemicals such as aniline and trinitrotoluene the latter factor is of vital importance. Every worker must be protected against absorption, whether or not his skin is sensitive. It may almost be said that the development of dermatitis in these workers is an insurance against greater risks.

In the case of skin-penetrating chemicals with less dramatic effects, or even with no known effects, this factor should still be kept in mind. With this end in view I would like the following principle, which I have mentioned before (*J. Indust. Welfare*, June, 1938, p. 229), applied to skin protectives: Skin protectives should not contain any chemical which will act as a solvent of, or dissolve in, the substance to be handled.

I hope I shall be permitted to give "HEB protective" a trial. It is difficult to estimate results, however, owing to the beneficial effect that is caused merely by routine application and washing, which renders workers "skin-conscious."—I am, etc.,

Royal Arsenal, London, S.E.18, Feb. 20 A. L. LEIGH SILVER.

Endovascular Diathermy for Cirsoid Aneurysm

SIR,—The following case seems worthy of record because of the success of a treatment which appears to be new.

In May, 1938, a girl aged 14 was brought to me because of a swelling of the upper lip of six years' duration. On examination there was to be seen an extensive haemangioma of the right two-thirds of the upper lip, which pulsated. The right facial artery was larger than the left, and could be felt well down into the submaxillary triangle. On June 1 the right submaxillary triangle was explored with the object of deciding whether the large pulsating vessel was the facial artery or the anterior facial vein, for it has been suggested by Reid and Andrus that a cirsoid aneurysm is a variety of aneurysmal varix. The vessel was the facial artery beyond doubt. This vessel was then divided, and into the distal segment a small diathermy electrode, such as is used for cystoscopic endovesical diathermy, was inserted; this passed without difficulty to the angle of the mouth. A moderate current was turned on and the electrode slowly withdrawn. The angiomatous tissue was then excised from the lip.

The child has been re-examined after an interval of seven months. There is some suggestion of angiomatous tissue in the mucous membrane of the red margin of the lip, but no sign of pulsation. I feel that the use of a diathermy electrode as described above is worthy of further trial in cirsoid aneurysms in view of this encouraging case.—I am, etc.,

Birmingham, Feb. 6. HUGH DONOVAN.

Virus Diseases

SIR,—The virus era is the golden one of bacteriology and, as some would say, of medicine. But all is not gold that glitters, and in no connexion is this adage more applicable than in the present one. The filterable virus theory of the origin of so many of the manifestations of disease to which the term "infection" is commonly applied is the outcome of the practice of differentiation. My excuse for craving your space once again is to attempt to show the light the practice of correlation throws on the subject.

The so-called "virus diseases" are found first in plants, where they are most numerous and where bacteria (excluding fungi) play the smallest part in causing disease. As the scale of evolution is ascended the position becomes reversed, and when man is reached manifestations of disease caused by micro-organisms exceed those occasioned by ultra-microscopic viruses. From this the inference might be drawn that viruses are not terminal subphases of coccogenic micro-organisms, which in turn originate from other well-known bacilli (Friedländer's bacillus in particular). I thought at one time they might be. As most of the micro-organisms which cause what I term "infections from within" (and it is from these that viruses would most readily develop) do not directly cause or invade the lesions for which they are responsible, another factor enters. This factor is the most important of all, as it reveals that the host's main defensive mechanism is the chief invader. In other words, the manifestations of disease and the lesions which are formed

result from the abnormal chemico-physical changes to which the protein in the sap and blood have been subjected by the primary invaders, which can be separated into chemical, physical, and microbial. I infer that the filterable viruses are derived from certain of the damaged protein particles. Viruses appear to develop from the protein particles which undergo what I term "rehydration" and become precipitated in the skin and the central nervous system.

In plants and animals viruses are formed more readily and cause more generalized manifestations of disease than is the case in man. This is due in part to the chemico-physical properties of the protein particles being different in plants, in the various species of animals, and in man. Viruses are formed from protein particles which have reached different degrees of condensation, thus accounting for their plurality and variation in size. In the process of formation the protein particles are shorn, in a varying degree, of their adsorbed constituents; indeed, it is the nakedness of the protein particles which enables viruses to have such a destructive action upon the cells of the tissues and organs they attack. The inclusion bodies in the cells are formed in response to the action of the viruses, and the chemico-physical changes the cytoplasm undergoes are the same as those the protein particles in the sap and blood underwent in the first instance. There is no fundamental difference between the protein particles in the sap and plasma causing inclusion bodies and cellular necrosis and giving rise to innocent and malignant new growths, as in both cases the changes the cells undergo are in answer to the invasive action of the host's resistance. The mere process of filtration makes the rehydrated and hydrated protein particles yield ultramicroscopic viruses which might not have developed naturally. This explains why the search for viruses has proved so successful, and why they are credited with causing lesions for which these bodies are not responsible. The so-called "virus diseases" are best prevented and combated by mitigating the action of the primary invaders.—I am, etc.,

London, W.1, Feb. 15 J. E. R. McDONAGH.

The Problem of High Blood Pressure

SIR,—I was very interested to read Dr. G. W. Pickering's observations on high blood pressure based on experimental work in the issue of January 7 (p. 1). That it is justifiable to come to a similar conclusion on clinical grounds was shown by me in my *High Blood Pressure and its Common Sequelae* (Baillière, Tindall and Cox, 1935). To quote:

"We know in the first place that renal sclerosis is associated with high pressure. We cannot logically say that renal sclerosis is the only cause of high pressure, because the latter can be present in the absence of renal sclerosis. In the constant association of elevated pressure with renal sclerosis we see some justification for the assumption that the latter condition prevents the elimination of one or more bodies in the blood which raise the pressure. The work of Browne lends colour to this view. It is probably these same agents which are responsible for some cases of hypertension, for in renal disease it is their retention from non-excretion which helps to raise the pressure. The important findings of Bain and Major, that substances with a pressor action found in normal urine are absent or reduced in those suffering from high blood pressure, argue an impermeability of the kidney to these bodies. As arterial hypertension, and very high grades of it, is observed even when the kidneys are apparently well, the rational inference is that the arrest of some renal function which is not necessarily due to sclerosis results in the retention of these bodies in the blood. Where are they produced and how? Waller's valuable researches proved almost conclusively that the detoxicating functions of the liver are seriously interfered with in arterial hypertension. The non-protein nitrogen, the blood urea, and the amino-acid nitrogen (according to him) are all markedly increased in the latter condition. When we consider that it is generally accepted that this could be attributed to a dysfunction of the liver, would it not be rational to suppose or conjecture that a derangement of the liver is responsible for the presence of pressor or allied bodies in the urine? That early or advanced renal disease causing inefficient excretion of certain products, and thereby retaining them in the circulation, impairs the liver function, which in turn becomes responsible for the production of these bodies requiring, according to Bain, a hormone for their disintegration, is a view which squares with these observations. Such a hypothesis would explain why, in the absence of renal disease, too, these bodies are not excreted in the urine and why their excretion is diminished. It would also explain the cases occurring about the menopause and in eclampsia, as well as the early rise in pregnancy before albuminuria is present. A view of this kind not only harmonizes with Batty Shaw's pre-renal toxaemia, but it is also supported by Izod Bennett, who in my opinion rightly asserts that it is difficult to exclude a renal cause in all cases of essential hypertension. From a clinical standpoint it explains the fourth group mentioned above—namely, those which begin as hypertension without renal disease and end with renal disease with well-marked impairment of renal function. In the majority of cases of raised arterial pressure, therefore, the metabolic derivatives are probably present long before renal disease is evident, and in the latter circumstances these derivatives are due to the reflection of impaired renal function on some other organ, resulting in its inefficiency. Which is the organ? Personally I have always had the liver under suspicion, and Waller's work seems to convert me to this creed at once. Could the site of mischief be the skeletal muscles? Or can it be the kidney itself? No definite answer seems possible at this stage of our knowledge, and the verdict must be left open."

With regard to the inference drawn from the results of constricting the renal arteries, may it not be that certain pressor bodies produced elsewhere are denied free access to the kidneys to be excreted there? In favour of this view is the fact that it has been observed that in some cases where back-pressure on the kidneys is present in patients with enlarged prostates a blood pressure higher than normal falls after the prostate is removed.—I am, etc.,

H. O. GUNEWARDENE.

General Hospital, Colombo, Feb. 5.

Diphtheria Immunization

SIR,—With reference to the memorandum supplied by the honorary secretary of the Wandsworth Division of the B.M.A. (*Supplement*, February 11, p. 66), there is a comparison of notified cases of diphtheria in New York State between 1925 and 1930. Before any deduction can be drawn from these figures the records for earlier years should be given. Moreover, every practitioner knows that notifications are not a real indication of the amount of diphtheria in the district. Even the published death rate from diphtheria may be misleading, but it is certainly a better criterion than the recorded incidence. Doctors sent by the Hull Corporation to Edinburgh in 1924 to investigate immunization pointed out that the chief reduction in New York in deaths from diphtheria took place in the twenty-five years 1890 to 1915, previous to the application of the Schick test. (See Dr. Forbes's report, "Prevention of Diphtheria, 1927, p. 47.)

During a discussion on diphtheria immunization in the Section of Public Health at the British Medical Association at Bournemouth in 1934, the president, Dr. Carnwath, pointed out: "It had been claimed that the fall in diphtheria mortality in New York had been due to wholesale immunization, but during the same period there had been a corresponding fall in London without this." During

that period the amount of immunization practised in London was negligible.

The memorandum of the Wandsworth Division states that "it is known that deaths from diphtheria can be prevented by immunization." There are records of at least thirty deaths from diphtheria of immunized children in this country. These are the admitted deaths. Keen advocates of immunization actually suggest that if, in a case of diphtheria in an immunized child, there is a negative reaction to the Schick test, the case should be rediagnosed as tonsillitis, regardless of the fact that fatal cases of diphtheria have occurred in Schick-negatives and that undoubted cases of diphtheria at Leeds and elsewhere have given a Schick-negative reaction during the course of the illness.

The memorandum also states that "the injections are almost painless." On the other hand, the medical officer for Hammersmith, in a report to his public health committee, said: "It appears that children receive the first injection without much objection, but difficulty is experienced in persuading the child to attend for the second and third injections. They become nervous, cry, and owing to this difficulty immunization has not been completed."—I am, etc.,

London, E.2, Feb. 11. M. BEDDOW BAYLY.

Sanitation and Holiday Camping

SIR,—A letter by Dr. R. Coates under the above heading in your issue of January 7 (p. 39) has been brought to my notice. Your correspondent is evidently ignorant of the fact that the 1936 Public Health Act gave local authorities absolute control over the sanitation, etc., of all camping grounds. The remedy is therefore in the hands of the local authorities, and most of them have been very active in controlling all regular camping grounds.

Further, your correspondent is ignorant of the fact that camping grounds all over the country are paying heavy rates to local authorities. I can instance a case of £700 a year being paid by the owners of one large camping ground without receiving any return at all from the local authorities except permission to use the water supply. Lastly, your correspondent is evidently ignorant of the very great benefit to health from camping and of the fact that no case of infectious disease spreading among holiday campers has ever yet occurred.—I am, etc.,

S. J. C. RUSSELL,
Organizing Secretary.

The Camping Club of Great Britain and Ireland, London, S.W.1.

The second statutory meeting of the International Assembly of Cosmobiology was held last December, and the third will take place in Mentone from April 9 to 11. In addition to the ordinary official business there will be a discussion of the scope and potentialities of this organization, and arrangements will be started for the holding in 1940 of the second international congress of the International Association of Cosmobiology. Further details may be obtained on application to Dr. M. Faure, the general secretary of the association, Rue Verdi 24, Nice. The fourteenth Easter holiday tour of the Medical Society of the Mediterranean Coast will begin on April 8 at Mentone; the places to be visited include l'Annonciade, the Italian frontier, Cap Martin, Monaco, Roquebrune, Villefranche, Cap d'Antibes, Juan-les-Pins, and Cannes. An extension of the tour to Corsica will be possible. Lectures and demonstrations of interest to medical practitioners will be given, and the full programme may be obtained from the climatological office of that medical society, Rue Verdi 24, Nice.

THE MEDICAL PROFESSION AND THE CANCER BILL

DEPUTATION FROM B.M.A.

The Minister of Health on February 21 received a deputation from the British Medical Association, who wished to discuss with him a number of questions which will arise if the Cancer Bill becomes law in connexion with the guidance which the Minister will give to the responsible local authorities.

Sir Kaye Le Fleming, Chairman of the Council of the British Medical Association, introduced the deputation, which included Professor R. M. F. Picken (chairman of the Public Health Committee), Sir Henry Brackenbury, Mr. Bishop Harman, Dr. J. W. Bone, and Dr. C. Hill (Deputy Secretary of the Association).

The deputation especially expressed the hope that the cancer schemes would make use of the facilities of the larger voluntary and municipal general hospitals, which normally provide the specialist services in each region, and would not establish separate special clinics not closely linked with the general hospitals. They also suggested that the arrangements for facilitating the diagnosis and early treatment of cancer should include the provision of consultant facilities in the homes of patients. They trusted that the Minister would direct the attention of local authorities to the desirability of the development of schemes on a regional basis, and that the Minister would make full use of the power given him by the Bill to require local authorities to combine for the purpose of making adequate arrangements for diagnosis and treatment.

Finally, they stressed the desirability of a system of uniform records of clinical findings so that proper statistical material might be available for purposes of investigation and research.

The Minister's Reply

In reply to the deputation the Minister mentioned that in addition to the Medical Advisory Committee, now of some years' standing, whose function it was to advise him on matters of common interest to the medical profession and the Ministry, he intended to appoint a subcommittee of this Medical Advisory Committee to advise him on general principles with regard to the treatment of cancer and to consider any questions on that subject which he might refer to them. He proposed to consult this subcommittee on the general exercise of his functions under the Cancer Bill, including the principles to be applied to the arrangements, which would have to be submitted to him for approval before they could be given effect. In this connexion he would gladly keep in mind the views expressed by the deputation. He could at once say that, broadly speaking, he was in agreement with the deputation's opinion that maximum use should be made of the facilities provided by the existing voluntary and municipal general hospitals, and that clinics should normally be closely associated with these hospitals. As for consultants, they would normally not be available except at hospitals and clinics, but he agreed that it might be found desirable to make arrangements for consultants to visit the homes of patients in exceptional cases. In many regions it would clearly be desirable that a large and well-equipped hospital should serve the areas of more than one local authority, and this might be achieved either by a series of agreements with each local authority or by one agreement with the combination of authorities. He fully agreed with the deputation as to the importance of the collection of records on a uniform basis and their utilization for the purposes of investigation and research. It thus seemed that there was no real point of difference between himself and the deputation on almost all their points.

Sir Kaye Le Fleming thanked the Minister for the way in which he had received the deputation's representations, and assured him that they were all concerned to do all in their power to make the cancer scheme a practical success.

Obituary

W. J. McCARDIE, B.A., M.B., B.CH.

Consulting Anaesthetist, General Hospital, Ear and Throat Hospital, and Dental Hospital, Birmingham

Dr. McCardie died on February 14 at the age of 74, and British medicine has lost one who was widely known and much liked, for he was both a pioneer and a personality. Born at Edgbaston, William Joseph McCardie was the eldest son of the late Joseph William McCardie and a brother of the late Mr. Justice McCardie. His father died when he was 7 years of age. He was educated at King Edward's School and at Caius College, Cambridge, where he graduated in 1889. He then came to Queen's College, Birmingham, and having qualified with the M.R.C.S., L.R.C.P. in 1894 he obtained the M.B., B.Ch.Camb. in 1895. He held resident posts at the General Hospital, where he was a contemporary of Professor Gamgee, who at that time was resident surgical officer. In 1897 he decided to set up as anaesthetist, and he joined the staff of the General Hospital as a visiting anaesthetist. He was the first anaesthetist outside London to confine himself exclusively to anaesthetics; he became consulting anaesthetist to the hospital in 1926, and finally ceased practice at the end of last year after forty-one years in anaesthetics. He had been a member of the British Medical Association for forty-two years, was secretary of the Section of Anaesthetics at the London Meeting of 1910, vice-president at Liverpool in 1912, and president at Glasgow in 1922.

From the scientific point of view McCardie's contribution to anaesthetics was more important than we are able to appreciate in the present atmosphere of skilled collaboration between chemical manufacturer and pharmacologist and experimental physiologist, who, when data and practical details have been ascertained, hand on the various new drugs to the clinician. In those days, when careful clinical observation was establishing the best methods for routine practice, he was a pioneer. He took ample notes of all unusual cases, and until nearly the end of his career he recorded the numbers of various types of anaesthetics which he had administered. His study of contemporary literature was wide and thorough, and his boxes of cuttings from current medical journals, which were generously placed at my disposal some twenty years ago, testified to his zeal and his desire to establish sound practice. Until his health began to fail he rarely missed a meeting of the Section of Anaesthetics of the Royal Society of Medicine, of which he was president as long ago as 1907. The late Sir Frederic Hewitt regarded McCardie as his close friend and disciple, and among British anaesthetists McCardie was an honoured figure. Many pieces of anaesthetic apparatus and "gadgets" which are now in routine use were designed by him. The use of ethyl chloride as a general anaesthetic was introduced largely through his careful investigation of its qualities. Status lymphaticus, that elusive problem, was the subject of one of his many papers.

His private practice in earlier days was unique, and he travelled widely over the Midlands to give anaesthetics. To generations of surgeons and practitioners he was helper, teacher, and, on innumerable occasions, anaesthetist to themselves or members of their families. For many years patients who were discussing arrangements for an operation did not ask for an anaesthetic; they asked for "McCardie." With him the practice of anaesthetics was the interest of his life. Until his health became poor, golf and lawn tennis provided him with relaxation, and he was good at each (he possessed his county Colours for lawn tennis); but he had no other hobbies. He loved company, and, whether host or guest, his gentle, easy, and yet dignified manner endeared him to the wide circle of friends and colleagues who sat at his hospitable board or met him on other occasions. A strong supporter of British sport and British institutions, he was a true conservative. He never drove a motor-car, but usually sat in the front seat. Patient and long suffering, sensitive and sympathetic, he was a most lovable man. Whether he was telling quaint stories to the young with a riddle or a limerick, or discussing the problems of the day with the more elderly, a visit from "Mac" was a soothing and helpful restorative to many a convalescent. In later years, notwithstanding his failing health, family bereavements which brought great sorrow made him seek the comfort of his work, but the time came when this had to be relinquished. He retired to Warwick at the end of last year, and the illness which began some years ago bore him peacefully away. To Mrs. McCardie, his two sons, and his daughter we extend our deep sympathy, and we share with them the happy memory of a charming gentleman.

H. W. F.

Sir Gilbert Barling writes:

Forty-two years ago W. J. McCardie, who had filled resident posts at the General Hospital, came under my notice as one who gave anaesthetics better than most juniors. At this time surgery was making great advances, operations of increasing severity were being undertaken, and parts of the body invaded that had to a great extent been prohibited to the surgeon. The importance of capable anaesthetists became more and more recognized, and I urged McCardie to take up as his life's work the administration of anaesthetics. This specializing led to the exclusion of the general practitioner in many cases from a task he had hitherto undertaken, and it was at first resented, but now, of course, the importance of the specialty is fully recognized. For many years I had the valued assistance of McCardie both in hospital and in private work; he gave that confidence which enabled me to devote the whole of my attention to my own proper task, instead of giving half an eye to what a partly trained man was doing. Surgeons in and around Birmingham appreciated the value of what was a new departure, and my friend soon developed an extensive practice in his special line. If any new method or material for anaesthesia was propounded he turned his attention to it, and formed his own sound conclusion as to its value.

Like many others of his own profession, I was deeply indebted to him for personal administrations of anaesthetics, especially on one occasion twelve years ago when an operation was called for. I had only partly recovered from a cardiac thrombosis, and he gave me that feeling of confidence in a trying ordeal which he always appeared to convey to those requiring his services, and which was of such inestimable value.

McCardie by his skill, his personal touch, and his cheeriness gathered round him a degree of affectionate regard not given to many. For the last few years, to the deep regret of everyone, he has suffered from an illness which his devoted colleagues have not been able to control. The hope that relinquishing work would give him some degree of recovery and enjoyment of life was, alas, soon disappointed.

G. J. JENKINS, O.B.E., F.R.C.S.

Late Aural Surgeon, King's College Hospital

George John Jenkins, who died last week, was one of the foremost otologists of our time. He left Australia at the age of 17 and qualified at Edinburgh in 1895. He then came up to London, took the F.R.C.S. in 1902, and became assistant surgeon to Arthur Cheatle at King's College Hospital, and on Cheatle's retirement succeeded him in the department. He was secretary of the Section of Oto-laryngology at the International Congress in 1913, president of the Section of Otology of the Royal Society of Medicine in 1925, and an original member of the Visiting Association of Throat and Ear Surgeons, and of the Collegium Oto-laryngologicum. He was also aural surgeon to the Florence Nightingale Hospital, the German Hospital, and the Lambeth and St. Charles's Hospitals. He was awarded the O.B.E. for his work during the war.

As a surgeon Jenkins was admirable; he was dextrous, resolute, and courageous. His great experience, wide knowledge, and resource made him a most valuable colleague in a difficult case, and his unfailing kindness and willingness to help made it easy for less experienced men to come to him in any emergency. Although he did most useful work on the operative side of the specialty (his papers on the treatment of meningitis, on fractures of the basis cranii, and on cystic serous meningitis are well known), he will probably be best remembered for his indefatigable researches on otosclerosis. His work on otosclerosis and osteitis deformans and on paracusis has stood the test of intensive inquiry, and his early operations for otosclerosis, described in 1913, have been generously recognized by his successors in this field, Professor Gunnar Holmgren and Dr. Sourdille.

But great as his achievements were, it was the man himself that his friends will remember best. His simplicity and enthusiasm, whether for his work, for fishing, for country life, his generous admiration of any good work or of any good workman, his detestation of intrigue and advertisement, his complete sincerity, formed a lovable character. His work is an enduring memorial; the memorial he will best appreciate is the esteem and affection of his friends and the gratitude of those he helped.

F. W. W.-T.

D. T. RICHARDS, M.D.

Dr. David Theophilus Richards died at his home in Cross-Keys, Monmouthshire, on January 16. He was 81 years of age and had been in practice for thirty years, retiring in 1913, although his services were freely available to his colleagues afterwards, for he continued to reside in the district. Dr. Richards was a native of Cardiganshire and was educated at the University College of Wales, Aberystwyth, and afterwards at the University of Glasgow, where he graduated M.B., B.Ch. in 1883 and M.D. in 1890.

Dr. Ivor J. Davies (Cardiff) writes: Dr. Richards was appointed surgeon to the Risca Collieries in 1886 and took his M.D. degree in the early years of a very busy colliery practice. This achievement was so characteristic of his determination to do his best always in the practice of his profession. He was an excellent general practitioner, and before the day of the local hospital did a great deal of surgery, as was customary throughout the South Wales coalfield in the past. Despite the exacting duties of a colliery practitioner, D. T. Richards remained a keen student of medicine and contrived almost every year to attend a postgraduate course in various centres in this country and abroad, and kept it up for some time longer even in his retirement. It will, then, be clear that he was a man of exceptional character and lofty ideals, which he maintained undiminished to the end. These were all combined with a most generous and kindly nature, and to all in this one-time busy mining area he was the trusted family counsellor. I was privileged to enjoy his friendship for a long time, and met none who more consistently upheld the Hippocratic standards of learning, of sagacity, of humanity, of probity. He had a fine presence, and his tall spare figure and distinguished appearance would be immediately noticeable and felt at any meeting which he attended. His reading was extensive, both general and medical, and up to the last he renewed the editions of his favourite medical authors and passed on many valuable monographs to me and other friends. He would often refer to the colliers and to their special difficulties apart from the grave risks of their occupation. Dr. Richards had an intimate knowledge of their home life and was deeply sensitive of their economic trials. It is only a colliery surgeon of long experience who could write the true story of the moving human drama of medical practice in the coalfields: such a notable contribution to the literature of our land has yet to be made. He was a great walker, and up to a few weeks before his death regularly climbed the local hillside, which rises fairly sharply to a height of well over a thousand feet above sea-level. In the narrow mining valleys for recreation we have to choose between walking along the main road or getting up the hillside. Dr. Richards invariably made for the hill, and his zest for climbing undoubtedly meant much more to him than the mere physical effort, although this in itself was a remarkable achievement in his last years. It was symbolic of his indomitable spirit and of the high ideal which he set for himself in early life and which he so well maintained to advanced age. The vicar (the Rev. John Evans, B.A.), in an eloquent address at the funeral service, chose as his text "For he was a good man," and applied this in full measure in his tribute to Dr. Richards. The vicar also quoted Goethe in "The highest cannot be spoken, but it can be lived and manifested on the plane of human life." Dr. Richards was a justice of the peace for the County of Monmouthshire, and for several years was a member of the county council. He was a brother-in-law and lifelong friend of Dr. W. E. Thomas, the doyen of Welsh colliery surgeons, who represents South Wales on the Council of the British Medical Association.

We regret to announce that Dr. JOHN ALOYSIUS TIERNEY died suddenly at his residence in Worple Road, Wimbledon, S.W., on January 25. His death came as a great shock to his friends and patients. He was educated first at St. Aloysius College, Glasgow, and afterwards at Glasgow University, where he graduated M.B., Ch.B. in 1931, and immediately joined the British Medical Association. He came to London in 1934, when he started practice on his own at Wimbledon. Dr. Tierney was noted for his skill in diagnosis, and published in 1935 a report of a case of brachial embolism. A man of outstanding appearance and charming personality, his generosity and kindness, especially to the poor, will be remembered by all who knew him, while his untimely death has cut short what gave every promise of a brilliant career. The funeral took place at Glasgow on January 30.

We regret to announce the death on January 31 of Dr. ROBERT CUFF, who was for over forty years medical officer to the Royal Northern Sea Bathing Infirmary, Scarborough, and for fifty-five years a member of the British Medical Association. He was born at Binderton, Sussex, in November, 1857, and from Blackheath Pro-

prietary School went to study medicine at Guy's Hospital, qualifying as M.R.C.S. in 1882 and graduating M.B.Lond. in the following year. During his long period of practice at Scarborough Dr. Cuff was medical officer of health for the rural district and surgeon to the Scarborough Hospital. More than thirty years ago he founded, in conjunction with the late Lady Ida Sitwell, the Scarborough Convalescent Home for Children, of which he was honorary consulting medical officer and senior trustee. Dr. Cuff held office as president of the Yorkshire Branch of the British Medical Association in 1900 and chairman of the Scarborough Division in 1903–5; he was an honorary captain in the R.A.M.C. and a justice of the peace for Scarborough and the North Riding of Yorkshire. In 1928, following an illness, he went to live at Liss, in Hampshire, but returned to Scarborough two years ago.

Dr. ALEX. GRAY MCINTYRE died at his residence in Lenzie, Glasgow, on February 11. Born at South Queensferry, he was educated at Dollar Academy and George Watson's School. He graduated M.B., C.M. at Edinburgh in 1893, and shortly afterwards went as assistant physician to Dr. Rutherford at the Crichton Royal Institution. From there in 1898 he took his M.D.Edinburgh. Subsequently he took up general practice in Lenzie, where he had been actively engaged until a few weeks before his death. During the war he was appointed temporary captain, R.A.M.C., and was on the staff at Craiglockart Hospital. Dr. McIntyre took an active interest in medical affairs. For the past year he was chairman of the Dumbartonshire Division of the B.M.A., which he joined in 1912, and had been for many years a member of the County Panel and Insurance Committees. A man of quiet and unassuming manner, he was sound in his judgment, and his colleagues will miss the help of his mature experience. He is survived by his widow and one son, who is a member of the medical profession.

The death of Dr. FRANCIS DEMAINBRAY CROWDY on February 12 has robbed the community of one of the best type of family practitioner. Dr. Crowdy was a wise and able doctor, respected and esteemed by his colleagues and beloved by his patients. He was a member of the British Medical Association for thirty-seven years, but took no great part in public work; such activities were not quite suited to his modest and retiring personality; yet he exercised a powerful and beneficent influence in private life among the many families who chose him as their doctor. At Oxford, where he graduated in medicine in 1885, he was awarded a blue for association football, a fact unknown to many of his friends, and during the earlier years of the thirty spent in practice at Torquay he played cricket and took a general and kindly interest in all branches of sport. For some years he had retired from practice to end his days in the quiet country seclusion so dear to him, but his old friends still miss him, and younger colleagues still remember the kindly hints from him which enabled them to overcome the difficulties and avoid the pitfalls of general practice.

Mr. SYDNEY RUMBOLL, who practised at Leeds as a surgeon for more than half a century, died on February 16, aged 77. The son of an East Anglian clergyman, he was born at Cambridge, and from Woodbridge Grammar School he went to Corpus Christi College, Cambridge, and later to Edinburgh, where he obtained the Scottish triple qualification in 1886. After starting in practice in the Woodhouse Lane district of Leeds, he took the F.R.C.S.Ed. diploma in 1889. Among the appointments he held at Leeds were those of honorary surgeon to St. Faith's Maternity Hospital and to the Friendless Girls' Home. Mr. Rumboll was a Fellow of the Edinburgh Obstetrical Society and of the North of England Obstetrical and Gynaecological Society, and had been a member of the Leeds Division of the British Medical Association for over fifty years. At the Annual Meeting of the B.M.A. in 1892 he contributed a paper on "Anaesthetics, with Special Reference to the Use of Nitrous Oxide in Minor Surgery." Outside his profession Mr. Rumboll took a fatherly interest in building society work; he had been president of the Leeds Permanent Building Society and of the Leeds and District Property Owners' and Ratepayers' Association; he was also for nearly twenty years president of the Yorkshire Automobile Club, of which he was one of the earliest members. A keen volunteer medical officer in his early days of practice, he attained the rank of surgeon major in the 1st West Riding Volunteer Artillery. Another interest was local church affairs; he had long been a lay reader for the diocese of Ripon, and vicar's warden at St. George's Church, Leeds, and a trustee for other churches. He is survived by his second wife and an adopted son, Dr. Norman Rumboll, who is in practice in Leeds.

By the death of Dr. JAMES ARTHUR HARGREAVES Wetherby and the surrounding district in the West Riding of Yorkshire have lost a popular and highly esteemed medical man. Born at Rothwell Haigh, Leeds, on October 17, 1868, the son of James Hargreaves, a colliery proprietor, he was educated at the Leeds Parish Church School and Aberdeen University, graduating M.B., C.M. in 1890, and began practice at Wetherby in 1893. He was medical officer of health to the rural district council for forty-five years, and medical officer to the Post Office and to the Thorparch Grange Industrial School. In 1914 he was elected a member of the West Riding Panel Committee, and for many years served also on the West Riding Insurance Committee. During the war he was civilian medical officer to the North Deighton Manor Officers' Hospital and to the artillery units stationed at Wetherby. In 1923 he was placed on the panel of the West Riding magistrates. Dr. Hargreaves joined the Leeds Division of the British Medical Association in 1894, and served on a subcommittee of the Insurance Acts Committee three years ago; he was a past-president of the Leeds Medico-Chirurgical Society and of the York Medical Society, one of the founders of the Wetherby Golf Club and the Castle Garth Tennis Club, and president of the local Conservative Club and chairman of the Town Hall Trust. His elder son was killed at Passchendaele; his younger son is in general practice in Yorkshire.

The following well-known foreign medical men have died: Surgeon General PAITRE, director of the Val-de-Grâce School of the French Military Health Service, and member of the Académie de Chirurgie; Dr. LOUIS HENRI DESTOUCHES, editor of the *Courrier Médical*; Dr. H. J. M. PLANTENGA, a leading bacteriologist of Utrecht; Geh. Med. Rat GRAF MAXIMILIAN WISER, the ophthalmologist, of Bad Eilsen, in Schaumburg-Lippe, aged 75; Professor AMBROGIO BINDA, the Milanese physician; Dr. SABINO LEMBRO, an endocrinological surgeon of Naples; WASHINO OKADA, professor of oto-rhino-laryngology at Tokyo; Professor VACLAV LIBENSKI, a prominent cardiologist of Prague, aged 61; and Dr. ACHILLE HALBE, director of the Institute of Bacteriology and Hygiene of the Province of Namur and member of the Belgian Royal Academy of Medicine, aged 62.

The new chairman of the Sir Frederick Hobday Presentation Fund—the object of which is the endowment of a chair of comparative medicine in one of the universities—is Lorna, Countess Howe. One of the first to contribute was the Duke of Gloucester, and among the professional supporters of the Fund are Viscount Dawson of Penn, Lord Horder, Professor McCunn, M.R.C.S., M.R.C.V.S., and Mr. R. Chrystal Irving, F.R.C.V.S. The honorary secretary is Mr. E. T. Cox, 3, St. John's Avenue, Putney, S.W.15. The first £1,000 has now been obtained by contributions from over 850 subscribers. When a sufficient sum is forthcoming the chair will be open equally to graduates of both branches of medicine, human and veterinary, desirous of obtaining a doctorate. The specific line of study would be intercommunicable and analogous diseases of men and animals.

G. J. JENKINS, O.B.E., F.R.C.S.

Late Aural Surgeon, King's College Hospital

George John Jenkins, who died last week, was one of the foremost otologists of our time. He left Australia at the age of 17 and qualified at Edinburgh in 1895. He then came up to London, took the F.R.C.S. in 1902, and became assistant surgeon to Arthur Cheatle at King's College Hospital, and on Cheatle's retirement succeeded him in the department. He was secretary of the Section of Oto-laryngology at the International Congress in 1913, president of the Section of Otology of the Royal Society of Medicine in 1925, and an original member of the Visiting Association of Throat and Ear Surgeons, and of the Collegium Oto-laryngologicum. He was also aural surgeon to the Florence Nightingale Hospital, the German Hospital, and the Lambeth and St. Charles's Hospitals. He was awarded the O.B.E. for his work during the war.

As a surgeon Jenkins was admirable; he was dextrous, resolute, and courageous. His great experience, wide knowledge, and resource made him a most valuable colleague in a difficult case, and his unfailing kindness and willingness to help made it easy for less experienced men to come to him in any emergency. Although he did most useful work on the operative side of the specialty (his papers on the treatment of meningitis, on fractures of the basis cranii, and on cystic serous meningitis are well known), he will probably be best remembered for his indefatigable researches on otosclerosis. His work on otosclerosis and osteitis deformans and on paracusis has stood the test of intensive inquiry, and his early operations for otosclerosis, described in 1913, have been generously recognized by his successors in this field, Professor Gunnar Holmgren and Dr. Sourdille.

But great as his achievements were, it was the man himself that his friends will remember best. His simplicity and enthusiasm, whether for his work, for fishing, for country life, his generous admiration of any good work or of any good workman, his detestation of intrigue and advertisement, his complete sincerity, formed a lovable character. His work is an enduring memorial; the memorial he will best appreciate is the esteem and affection of his friends and the gratitude of those he helped.

F. W. W.-T.

D. T. RICHARDS, M.D.

Dr. David Theophilus Richards died at his home in Cross-Keys, Monmouthshire, on January 16. He was 81 years of age and had been in practice for thirty years, retiring in 1913, although his services were freely available to his colleagues afterwards, for he continued to reside in the district. Dr. Richards was a native of Cardiganshire and was educated at the University College of Wales, Aberystwyth, and afterwards at the University of Glasgow, where he graduated M.B., B.Ch. in 1883 and M.D. in 1890.

Dr. Ivor J. Davies (Cardiff) writes: Dr. Richards was appointed surgeon to the Risca Collieries in 1886 and took his M.D. degree in the early years of a very busy colliery practice. This achievement was so characteristic of his determination to do his best always in the practice of his profession. He was an excellent general practitioner, and before the day of the local hospital did a great deal of surgery, as was customary throughout the South Wales coalfield in the past. Despite the exacting duties of a colliery practitioner, D. T. Richards remained a keen student of medicine and contrived almost every year to attend a postgraduate course in various centres in this country and abroad, and kept it up for some time longer even in his retirement. It will, then, be clear that he was a man of exceptional character and lofty ideals, which he maintained undiminished to the end. These were all combined with a most generous and kindly nature, and to all in this one-time busy mining area he was the trusted family counsellor. I was privileged to enjoy his friendship for a long time, and met none who more consistently upheld the Hippocratic standards of learning, of sagacity, of humanity, of probity. He had a fine presence, and his tall spare figure and distinguished appearance would be immediately noticeable and felt at any meeting which he attended. His reading was extensive, both general and medical, and up to the last he renewed the editions of his favourite medical authors and passed on many valuable monographs to me and other friends. He would often refer to the colliers and to their special difficulties apart from the grave risks of their occupation. Dr. Richards had an intimate knowledge of their home life and was deeply sensitive of their economic trials. It is only a colliery surgeon of long experience who could write the true story of the moving human drama of medical practice in the coalfields: such a notable contribution to the literature of our land has yet to be made. He was a great walker, and up to a few weeks before his death regularly climbed the local hillside, which rises fairly sharply to a height of well over a thousand feet above sea-level. In the narrow mining valleys for recreation we have to choose between walking along the main road or getting up the hillside. Dr. Richards invariably made for the hill, and his zest for climbing undoubtedly meant much more to him than the mere physical effort, although this in itself was a remarkable achievement in his last years. It was symbolic of his indomitable spirit and of the high ideal which he set for himself in early life and which he so well maintained to advanced age. The vicar (the Rev. John Evans, B.A.), in an eloquent address at the funeral service, chose as his text "For he was a good man," and applied this in full measure in his tribute to Dr. Richards. The vicar also quoted Goethe in "The highest cannot be spoken, but it can be lived and manifested on the plane of human life." Dr. Richards was a justice of the peace for the County of Monmouthshire, and for several years was a member of the county council. He was a brother-in-law and lifelong friend of Dr. W. E. Thomas, the doyen of Welsh colliery surgeons, who represents South Wales on the Council of the British Medical Association.

We regret to announce that Dr. JOHN ALOYSIUS TIERNEY died suddenly at his residence in Worple Road, Wimbledon, S.W., on January 25. His death came as a great shock to his friends and patients. He was educated first at St. Aloysius College, Glasgow, and afterwards at Glasgow University, where he graduated M.B., Ch.B. in 1931, and immediately joined the British Medical Association. He came to London in 1934, when he started practice on his own at Wimbledon. Dr. Tierney was noted for his skill in diagnosis, and published in 1935 a report of a case of brachial embolism. A man of outstanding appearance and charming personality, his generosity and kindness, especially to the poor, will be remembered by all who knew him, while his untimely death has cut short what gave every promise of a brilliant career. The funeral took place at Glasgow on January 30.

We regret to announce the death on January 31 of Dr. ROBERT CUFF, who was for over forty years medical officer to the Royal Northern Sea Bathing Infirmary, Scarborough, and for fifty-five years a member of the British Medical Association. He was born at Binderton, Sussex, in November, 1857, and from Blackheath Pro-

prietary School went to study medicine at Guy's Hospital, qualifying as M.R.C.S. in 1882 and graduating M.B.Lond. in the following year. During his long period of practice at Scarborough Dr. Cuff was medical officer of health for the rural district and surgeon to the Scarborough Hospital. More than thirty years ago he founded, in conjunction with the late Lady Ida Sitwell, the Scarborough Convalescent Home for Children, of which he was honorary consulting medical officer and senior trustee. Dr. Cuff held office as president of the Yorkshire Branch of the British Medical Association in 1900 and chairman of the Scarborough Division in 1903–5; he was an honorary captain in the R.A.M.C. and a justice of the peace for Scarborough and the North Riding of Yorkshire. In 1928, following an illness, he went to live at Liss, in Hampshire, but returned to Scarborough two years ago.

Dr. ALEX. GRAY MCINTYRE died at his residence in Lenzie, Glasgow, on February 11. Born at South Queensferry, he was educated at Dollar Academy and George Watson's School. He graduated M.B., C.M. at Edinburgh in 1893, and shortly afterwards went as assistant physician to Dr. Rutherford at the Crichton Royal Institution. From there in 1898 he took his M.D.Edinburgh. Subsequently he took up general practice in Lenzie, where he had been actively engaged until a few weeks before his death. During the war he was appointed temporary captain, R.A.M.C., and was on the staff at Craiglockart Hospital. Dr. McIntyre took an active interest in medical affairs. For the past year he was chairman of the Dumbartonshire Division of the B.M.A., which he joined in 1912, and had been for many years a member of the County Panel and Insurance Committees. A man of quiet and unassuming manner, he was sound in his judgment, and his colleagues will miss the help of his mature experience. He is survived by his widow and one son, who is a member of the medical profession.

The death of Dr. FRANCIS DEMAINBRAY CROWDY on February 12 has robbed the community of one of the best type of family practitioner. Dr. Crowdy was a wise and able doctor, respected and esteemed by his colleagues and beloved by his patients. He was a member of the British Medical Association for thirty-seven years, but took no great part in public work; such activities were not quite suited to his modest and retiring personality; yet he exercised a powerful and beneficent influence in private life among the many families who chose him as their doctor. At Oxford, where he graduated in medicine in 1885, he was awarded a blue for association football, a fact unknown to many of his friends, and during the earlier years of the thirty spent in practice at Torquay he played cricket and took a general and kindly interest in all branches of sport. For some years he had retired from practice to end his days in the quiet country seclusion so dear to him, but his old friends still miss him, and younger colleagues still remember the kindly hints from him which enabled them to overcome the difficulties and avoid the pitfalls of general practice.

Mr. SYDNEY RUMBOLL, who practised at Leeds as a surgeon for more than half a century, died on February 16, aged 77. The son of an East Anglian clergyman, he was born at Cambridge, and from Woodbridge Grammar School he went to Corpus Christi College, Cambridge, and later to Edinburgh, where he obtained the Scottish triple qualification in 1886. After starting in practice in the Woodhouse Lane district of Leeds, he took the F.R.C.S.Ed. diploma in 1889. Among the appointments he held at Leeds were those of honorary surgeon to St. Faith's Maternity Hospital and to the Friendless Girls' Home. Mr. Rumboll was a Fellow of the Edinburgh Obstetrical Society and of the North of England Obstetrical and Gynaecological Society, and had been a member of the Leeds Division of the British Medical Association for over fifty years. At the Annual Meeting of the B.M.A. in 1892 he contributed a paper on "Anaesthetics, with Special Reference to the Use of Nitrous Oxide in Minor Surgery." Outside his profession Mr. Rumboll took a fatherly interest in building society work; he had been president of the Leeds Permanent Building Society and of the Leeds and District Property Owners' and Ratepayers' Association; he was also for nearly twenty years president of the Yorkshire Automobile Club, of which he was one of the earliest members. A keen volunteer medical officer in his early days of practice, he attained the rank of surgeon major in the 1st West Riding Volunteer Artillery. Another interest was local church affairs; he had long been a lay reader for the diocese of Ripon, and vicar's warden at St. George's Church, Leeds, and a trustee for other churches. He is survived by his second wife and an adopted son, Dr. Norman Rumboll, who is in practice in Leeds.

By the death of Dr. JAMES ARTHUR HARGREAVES Wetherby and the surrounding district in the West Riding of Yorkshire have lost a popular and highly esteemed medical man. Born at Rothwell Haigh, Leeds, on October 17, 1868, the son of James Hargreaves, a colliery proprietor, he was educated at the Leeds Parish Church School and Aberdeen University, graduating M.B., C.M. in 1890, and began practice at Wetherby in 1893. He was medical officer of health to the rural district council for forty-five years, and medical officer to the Post Office and to the Thorparch Grange Industrial School. In 1914 he was elected a member of the West Riding Panel Committee, and for many years served also on the West Riding Insurance Committee. During the war he was civilian medical officer to the North Deighton Manor Officers' Hospital and to the artillery units stationed at Wetherby. In 1923 he was placed on the panel of the West Riding magistrates. Dr. Hargreaves joined the Leeds Division of the British Medical Association in 1894, and served on a subcommittee of the Insurance Acts Committee three years ago; he was a past-president of the Leeds Medico-Chirurgical Society and of the York Medical Society, one of the founders of the Wetherby Golf Club and the Castle Garth Tennis Club, and president of the local Conservative Club and chairman of the Town Hall Trust. His elder son was killed at Passchendaele; his younger son is in general practice in Yorkshire.

The following well-known foreign medical men have died: Surgeon General PAITRE, director of the Val-de-Grâce School of the French Military Health Service, and member of the Académie de Chirurgie; Dr. LOUIS HENRI DESTOUCHES, editor of the *Courrier Médical*; Dr. H. J. M. PLANTENGA, a leading bacteriologist of Utrecht; Geh. Med. Rat GRAF MAXIMILIAN WISER, the ophthalmologist, of Bad Eilsen, in Schaumburg-Lippe, aged 75; Professor AMBROGIO BINDA, the Milanese physician; Dr. SABINO LEMBRO, an endocrinological surgeon of Naples; WASHINO OKADA, professor of oto-rhino-laryngology at Tokyo; Professor VACLAV LIBENSKI, a prominent cardiologist of Prague, aged 61; and Dr. ACHILLE HALBE, director of the Institute of Bacteriology and Hygiene of the Province of Namur and member of the Belgian Royal Academy of Medicine, aged 62.

The new chairman of the Sir Frederick Hobday Presentation Fund—the object of which is the endowment of a chair of comparative medicine in one of the universities—is Lorna, Countess Howe. One of the first to contribute was the Duke of Gloucester, and among the professional supporters of the Fund are Viscount Dawson of Penn, Lord Horder, Professor McCunn, M.R.C.S., M.R.C.V.S., and Mr. R. Chrystal Irving, F.R.C.V.S. The honorary secretary is Mr. E. T. Cox, 3, St. John's Avenue, Putney, S.W.15. The first £1,000 has now been obtained by contributions from over 850 subscribers. When a sufficient sum is forthcoming the chair will be open equally to graduates of both branches of medicine, human and veterinary, desirous of obtaining a doctorate. The specific line of study would be intercommunicable and analogous diseases of men and animals.

Medico-Legal

A MISSING SWAB: NEW TRIAL ORDERED

Surgeons and others were deeply interested and not a little concerned at the result of the recent action, Mahon *v.* Osborne, heard by Mr. Justice Atkinson and a special jury at Manchester Assizes last April.[1] By some mischance a large swab was left in the body of a patient after Mr. Osborne had operated on him for a perforated duodenal ulcer. The jury found that the surgeon did not make a reasonably sufficient search for the swab, and that if he had the search would have disclosed the missing swab. They awarded £616 damages. The surgeon appealed, and Mr. John Morris, K.C., argued for him that the hospital had an elaborate system of counting swabs; a miscount was made at some time but the surgeon had done nothing wrong; if he had searched all round the abdomen for swabs he would have prolonged the operation and endangered the patient's life. He had no reason to suppose that a swab had been left in. Lord Justice Scott, in giving the judgment of the court, said that the case for the widow of the patient had been wrongly presented as one of *res ipsa loquitur*. This phrase refers to a class of cases in which the circumstances of the injury raise a presumption that the defendant was negligent: "the accident speaks for itself," and negligence will be presumed unless the defendant can put forward an innocent explanation. The maxim will apply when it is so improbable that the accident would have happened without negligence that a reasonable jury could find without further evidence that it was so caused.[2] The accident must be one which in the ordinary course of things does not happen if those who have the management use proper care.[3] Scott, L.J., found it difficult to see how the principle of *res ipsa loquitur* could apply generally to swab cases. The very essence of the rule, he said, is that on the mere fact of the event happening there arise two presumptions: that the event was caused by somebody's negligence, and that the defendant was that somebody. The presumption of fact only arises because it is an inference which the reasonable man would naturally draw. The nature of abdominal operations, he pointed out, varies widely and many considerations enter in. In the present case a state of things was presented of which the ordinary experience of mankind knows nothing, and it was unsafe to beg the question of proof. Lord Justice Goddard disagreed, saying that he thought the evidence might warrant the jury in finding that the surgeon did not make a sufficiently careful search for swabs. Lord Justice MacKinnon, however, agreed with Lord Justice Scott, and the Court by a majority allowed the appeal and ordered a new trial. They gave leave to the widow, however, to appeal to the House of Lords against their decision, and so the new trial will perhaps not be held until their Lordships have reviewed the case.

An interesting feature of the appeal was that counsel cited at considerable length the unreported case of James *v.* Dunlop[4] from a verbatim report of the judgment. In that case Lord Justice Scrutton is reported to have said that the doctor who put the swabs in ought to take them out, but the majority of the present Court indicated that they would prefer to look at the facts of every case and not formulate a general rule of law. The medical view of these cases is well known: that the principle of teamwork ought to be recognized. The legal view is still very vague. The House of Lords may perhaps say something to clarify it if the case comes before them.

[1] *British Medical Journal*, 1938, **1**, 1073.
[2] *Salmond on Torts*, 8th ed., p. 467.
[3] Scott *v.* London and St. Katherine's Docks Co., 1865, 3 H. & C., p. 596.
[4] *British Medical Journal*, 1931, **1**, 730.

The Services

ROYAL VISIT TO CANADA

The names of the members of the suite to accompany the King and Queen on their visit to Canada next May were announced from Buckingham Palace last week. Surgeon Captain H. E. Y. White, C.V.O., M.D., F.R.C.S.Ed., R.N., Honorary Surgeon to the King, will be in attendance as medical officer. Surgeon Captain White has served in the Royal yacht *Victoria and Albert* since 1927; he accompanied the Prince of Wales on his Empire tours in H.M.S. *Renown* and H.M.S. *Repulse*, and also their present Majesties on the visit to New Zealand and Australia in 1927. The battle cruiser *Repulse*, carrying the King and Queen and their suite, sails from Portsmouth for Canada on May 8 and is due back at the same port on June 22.

R.A.M.C. SUPPLEMENTARY RESERVE

The War Office draws attention to the fact that medical practitioners up to 32 years of age, who would have a preference in times of national emergency for army work, can, with practically no inconvenience to themselves, place their services with the Regular Army by joining the Royal Army Medical Corps, Supplementary Reserve of Officers. Many members of this reserve are commissioned in the rank of lieutenant, and are eligible for promotion to the rank of captain after one year's service. Their obligations are to be available for service with the regular forces in any part of the world when the Army Reserve is called out by proclamation.

MILITARY CROSS

Captain A. F. H. Keatinge, R.A.M.C., has been awarded the Military Cross for gallant and distinguished services in Palestine.

DEATHS IN THE SERVICES

MAJOR-GENERAL H. E. M. DOUGLAS, V.C.

Major-General Henry Edward Manning Douglas, V.C., C.M.G., D.S.O., late R.A.M.C., died at Droitwich on February 14, aged 67. He was born on July 11, 1871, the son of Mr. George Alexander Douglas of Kingston, Jamaica, educated at Edinburgh, and took the Scottish triple qualification in 1898. Entering the R.A.M.C. on July 27, 1899, he became lieutenant-colonel in the long war promotion list of March 1, 1915, brevet colonel on January 1, 1918, colonel on March 27, 1926, major-general on October 12, 1929, and retired on October 13, 1933. He had a long, brilliant, and successful career in the R.A.M.C., during which he saw much war service. It was at Magersfontein, where General Wauchope was killed, that he gained the Victoria Cross while still a lieutenant. Though wounded himself early in the engagement, he went out under heavy fire to help the wounded, dressing the wounds of Captain Gordon of the Gordon Highlanders, of Major Robinson, and of several wounded soldiers, and brought them out to safety under a heavy fire. His war services comprise the South African War, where he took part in the advance on Kimberley, including the action at Magersfontein, where he was wounded, and in operations in the Orange River Colony and in Cape Colony, was mentioned in dispatches in the *London Gazette* of March 16, 1900, and received the Queen's medal with five clasps, the V.C., and the D.S.O.; East Africa, 1904, operations in Somaliland, including the action at Jidballi, receiving the medal with two clasps; the Balkan campaign of 1913, as British Red Cross Commissioner with the Greek forces; and the war of 1914–18, when he served for over four years in France, most of the time as A.D.M.S. of the 29th Division, then as A.D.M.S. at Archangel of the British troops in Russia, and finally for a short time in Iraq, was mentioned in dispatches in the *London Gazette* of January 12, 1916, and of December 21, 1917, and received a brevet as colonel and the C.M.G. In addition to the V.C., C.M.G., and D.S.O., General Douglas had received several foreign decorations—three Serbian (the Red Cross, Samaritan, and St. Sava), and the French Croix de Guerre with palms. On attaining administrative rank in 1926 he was appointed D.D.M.S. of the Scottish Command

in Edinburgh, and in September, 1926, succeeded Colonel Mainprise as Commandant of the Royal Army Medical College at Millbank, where he was a successful and popular head. On promotion to major-general he went to India, where he served for four years as D.D.M.S. of the Southern Command, with headquarters at Poona. On the expiration of his four years' tenure of that post his long and successful service came to an end.

Lieutenant-Colonel JOHN RIORDAN, R.A.M.C. (ret.), died on October 19, 1938, aged 82. He was born on March 2, 1856, was educated in Ireland, and graduated M.B., M.Ch. in the Royal University of Ireland in 1882. Entering the Army as surgeon on August 4, 1883, he became lieutenant-colonel after twenty years' service, and retired on December 12, 1903. After retirement he was employed at Clonmel from 1904 to 1916. He served in the Burmese campaign of 1885–6, and received the Indian frontier medal with a clasp.

Lieutenant-Colonel HARVIE SCOTT, R.A.M.C. (ret.), died at Ipswich on December 5, 1938, shortly before his ninetieth birthday. He was born at Dublin on December 27, 1848, and was educated at Trinity College, Dublin, where he graduated M.B. in 1871, also taking the L.R.C.S.I. in the same year. Entering the Army as surgeon on September 20, 1874, he became surgeon lieutenant-colonel after twenty years' service, and retired on January 22, 1896. He served in the first Boer War of 1881 in the Transvaal. He was employed when on the retired list at Halifax, 1896–8; at Great Yarmouth, 1898–1905; in London as a recruiting medical officer from 1905 to 1910; at Landguard, 1910; and during the war of 1914–18 at Colchester in command of the military hospital there. After the war he was employed as deputy commissioner of national medical services at Ipswich.

Surgeon Captain LLEWELLYN LINDOP, R.N. (ret.), died at Kersal, Manchester, on February 16. He was educated at St. Mary's Hospital, and took the M.R.C.S., L.R.C.P. in 1900. Entering the Navy soon after qualifying, he became surgeon commander on August 2, 1914, and retired with an honorary step in rank on April 8, 1925. He served in the war of 1914–18, and received the medals. For over twelve years past he had been medical superintendent of the East Lancashire Home for Disabled Sailors and Soldiers at Kersal, Manchester. He had been a member of the British Medical Association for thirty-five years.

Universities and Colleges

UNIVERSITY OF OXFORD

REPORT ON THE NUFFIELD SCHEME

A report by the Nuffield Committee for the Advancement of Medicine for the year ending July 31, 1938, appears as a supplement to No. 2238 of the *Oxford University Gazette*. The report, which covers the work of the second year, or first full year, of the scheme is made to the trustees appointed under the deed of covenant, who record their appreciation of the expedition and thoroughness with which this complicated problem has been attacked. Two important financial arrangements are noted by the trustees. One is for a division of expenditure between the Nuffield Trust and the Radcliffe Infirmary, the effect of which is not to improve the standard of the infirmary at the expense of the medical school, but to share the cost of the rising standard between the two in the proportion in which they are both concerned. The other is an allocation of money for "fluid" research funds, not to be earmarked for either clinical or preclinical work. Whichever branch of research predominates from time to time will be automatically reflected in the calls made upon these funds.

All the several departments are at work, and many of them can be described as in full swing. Early difficulties of co-operation between the committee and the associated hospitals have been resolved, and such co-operation is now fully assured. The committee hopes that the next year or so will provide a breathing-space in which the clinical departments will get firmly established and begin to carry out original work. Future developments will depend not only on the trend of their special interests but also on the changes occurring in the hospital system and the nursing profession in this country, and the consequent demands which may be made on Oxford as a regional medical centre.

The department of clinical medicine reports the equipment of a new laboratory where biochemistry and medicine "exist in such a harmonious parabiosis that it is difficult to say where one ends and the other begins." Preparations are being made for complete metabolic balance experiments on alimentary haemorrhage, not only for the intrinsic value of the problem but also as a means of training staff in the wards and in the laboratory in this important research technique. In the department of surgery the new ward unit and operating theatre is established, the patients in twenty beds comprising selected cases—for the most part surgical—of diseases of the nervous system. Already there have been several contributions from the department to literature, and the same is true of the departments of obstetrics and gynaecology and of anaesthetics. Professor J. Chassar Moir has visited the United States in order to study at first hand various new methods of *x*-ray pelvimetry, and since his return has introduced certain of these into the work at Oxford. He also visited McGill to study certain research in clinical endocrinology, a specialty which it is thought it might be desirable for many reasons to establish at Oxford in the near future. In the spring of 1938 practitioners in Oxford and neighbourhood were notified of the start of the new Nuffield gynaecological departments, and large numbers of patients now attend the two clinics held weekly, and a waiting list has had to be formed. The pressure of clinical work in the department of obstetrics and gynaecology has left little time for research, but a start has been made in an investigation by radiological means of pelvic variations and the influence of such variations on the course of labour. In the department of orthopaedic surgery the outstanding event of the year under review was the erection of the new medical block at the Wingfield-Morris Hospital; it comprises clinical examination and demonstration rooms for the professor and his staff, research office, pathological laboratory, medical museum, and library.

In the Nuffield Institute for Medical Research the main work undertaken during the period has been an investigation of the pharmacological actions of a series of new compounds related to adrenaline. From the therapeutic point of view the aim has been to discover a drug superior to ephedrine for raising blood pressure, and one has been found promising enough to warrant clinical trial. Some of the compounds are related to benzedrine, and one of them seems to be a more powerful stimulant of the central nervous system than benzedrine itself. The report also embodies short accounts of the work in the various departments in the University Museum. The personnel working under the scheme on July 31 last included six professors, two readers, and nearly sixty other staff.

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

DIPLOMA IN MEDICAL RADIOLOGY AND ELECTROLOGY.—*Part 1:* H. N. Bhatt, R. B. Boal, J. P. Bostock, A. H. Brockbank, F. M. Crawshaw, J. A. G. Hair, *W. G. S. Harden, C. Harris, *T. M. Hennebry, E. C. Hicks, C. W. Horncastle, K. A.-K. Kassem, C. F. MacGuire, S. A. Maddocks, H. M. Marks, R. T. Marshall, M. P. G. O'Brien, *G. F. Rees-Jones, Zoe C. Rutherford, E. Samuel, Ida B. S. Scudder, K. V. Shetty, J. L. Treneman, *A. C. R. Wakeman, A. B. Wayte.

* Awarded distinction.

UNIVERSITY OF LONDON

Appointment

Sir William W. Jameson, M.D., F.R.C.P., has been appointed representative of the University at the Health Congress of the Royal Sanitary Institute at Scarborough, July 3 to 8.

Lectures

A lecture on "The Present Position of the Cancer Problem" will be given by Dr. W. E. Gye, F.R.S., Director of the Imperial Cancer Research Fund, at St. Thomas's Hospital Medical School, Albert Embankment, S.E., on Monday, March 20, at 5 p.m. The chair will be taken by Sir Cuthbert Wallace.

Dr. W. Schulemann, professor of pharmacology in the University of Bonn, will give a course of three lectures on "Chemotherapy" at the Wellcome Research Institution, 183, Euston Road, N.W., on Tuesday, Wednesday, and Thursday, March 7, 8, and 9, at 5.30 p.m.

All the above lectures, which will be illustrated with lantern slides, are addressed to students of the University and to others interested in the subject. Admission is free without ticket.

Amendment of Regulations

The regulations for the second examination for medical degrees for internal and external students in and after 1940 have been amended by the substitution for the words "shall occupy one-half of the students' time for five terms" in the third line of the syllabuses in human anatomy and physiology (*Red Book*, 1938–9, p. 285; *Blue Book*, September, 1938, p. 830) of the words "shall extend over five terms."

The regulations relating to exemptions at the second examination for medical degrees for internal students (*Red Book*, 1938–9, p. 266) have been amended as follows:

(1) By the addition of the following at the end of paragraph 3 (ii):

In and after 1940 students who have passed the examinations referred to above may apply for exemption from attendance at part of the course of study for the second examination for medical degrees.

(2) By the addition of the following at the end of paragraph 3 (v):

In and after 1940 students who have passed the examinations referred to above will be exempted from the course of study and examination in physiology but will be required to attend the prescribed courses in pharmacology and organic chemistry and will be examined in those subjects.

The regulations for external students (*Blue Book*, September, 1938, pp. 809–10) have been similarly amended.

The regulations for the M.S. examination for internal students (*Red Book*, 1938–9) have been amended by the addition of the following after the second paragraph on p. 306:

A candidate who has passed or presented himself for the M.S. examination in one branch may present himself for examination in another branch at a subsequent examination.

A candidate who has passed the M.S. examination, Branch I, will be exempted from the paper on the principles of surgery if he presents himself in Branches III or IV.

The regulations for external students (*Blue Book*, September, 1938, p. 851) have been similarly amended.

UNIVERSITY OF BIRMINGHAM

Forthcoming Lectures

Four William Withering Lectures on present aspects of the cancer problem will be given by Dr. Peyton Rous of the Rockefeller Institute, New York, in the anatomy theatre of the Medical School, Hospitals Centre, Birmingham, on March 9, 16, 21, and 23, at 4 p.m. Two Ingleby Lectures on "Infantile Diarrhoea" will be delivered by Dr. James M. Smellie on March 28 and April 4, at 4 p.m. Members of the medical profession and medical students are invited to attend the lectures.

UNIVERSITY OF LEEDS

The Council of the University has recently instituted a Lectureship in Medical Ethics and Conditions of General Practice. A short course of lectures will be given to students during their final year, and it is felt that this will be of great practical value and supply a long-felt need. The Council have appointed to the lectureship Dr. W. S. Macdonald, *M.C.*, D.P.H., J.P., a general practitioner of standing and experience and the chairman of the Leeds Division of the British Medical Association.

Professor J. J. Jervis has been appointed representative of the University at the Health Congress of the Royal Sanitary Institute at Scarborough, July 3 to 8.

W. G. France, M.B., Ch.B., has been appointed Demonstrator in Anatomy; E. A. Horne, M.B., Ch.B., Demonstrator in Pathology and Bacteriology; and H. S. Shucksmith, F.R.C.S., Surgical Tutor.

UNIVERSITY OF MANCHESTER

Robert Newton, M.D., M.C.O.G., has been appointed Assistant Lecturer in Obstetrics and Gynaecology.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At a quarterly meeting of the College, held on February 7, with the president, Dr. Alexander Goodall, in the chair, Dr. E. C. Fahmy (Edinburgh), Dr. I. D. Easton (Edinburgh), and Dr. J. C. M. Hamilton (Edinburgh) were introduced and took their seats as Fellows of the College.

Dr. J. G. Kininmonth (Edinburgh) and Dr. A. C. P. Campbell (Edinburgh) were elected Fellows of the College.

Dr. Henry Yellowlees was appointed the Morison Lecturer for 1939.

Medical Notes in Parliament

The House of Commons this week agreed to increase the Government's borrowing powers for the Defence Loan to £800,000,000. Supplementary Estimates were also down for consideration. Several Bills were advanced in the House of Lords.

The Parliamentary Medical Committee met at the House of Commons on February 21, Sir Francis Fremantle in the chair. The meeting was addressed by Sir Arthur Hurst, senior physician, Guy's Hospital, by Dr. Hebb of the Ministry of Health, and by Mr. Orde, secretary of the British Hospitals Association. Dr. Hebb surveyed the scheme for organizing into ten "sectors" the hospital services for the London area under A.R.P., details of which were expected to be published in a memorandum by the Ministry of Health later in the week. Mr. Orde raised questions of the application of the scheme to provincial hospitals. Sir Arthur Hurst put forward the alternative scheme proposed by the Guy's Hospital staff for keeping the staff of each medical school as intact as possible with its students, nurses, and possibilities of continued medical education in each of the sectors which were proposed in Dr. Hebb's scheme. In subsequent discussion it was stated that the authorities of the universities appeared to have convinced the Ministry of Health that such continued medical education as was possible in war-time should be carried on at university centres outside London. The working of the "sector" scheme appeared to the meeting to depend on the allocation of medical personnel, which remained to be determined by the Central and Local Emergency Committees under the British Medical Association. It was contended that in Outer London areas fixed aid posts would be of little value compared with mobile aid posts.

Criminal Justice Bill

The Select Committee of the House of Commons which is examining the Criminal Justice Bill resumed consideration on February 9 of an amendment to Clause 5, proposed by Mr. Benson, that persons placed on probation should not be ordered to pay expenses of mental treatment. Mr. MESSER said that if a court placed a person on probation with the condition that treatment was afforded, this admitted that the case was not for punishment but pathological, and should be treated accordingly.

Sir ARCHIBALD SOUTHBY opposed the amendment. He had dealt lately with the case of a medical man who suffered from dipsomania and had been charged with driving a car while drunk. It would have been wrong if the man had gone to the medical home to which the magistrates sent him and the whole cost of the treatment had to be met by the taxpayers and the ratepayers. Mr. EDE said no one could defend the treatment of rich kleptomaniacs being paid for by the community as a whole.

Mr. GEOFFREY LLOYD said that with regard to the class of people whose mental recovery required medical or surgical treatment the arguments advanced for the amendment did not arise at all. The scheme of the clause was that the richer people might be asked to contribute towards their treatment. These richer persons were not all dipsomaniacs or kleptomaniacs. There were also revolting sexual cases, not confined to London. It was wrong to deprive the courts of the power to secure a contribution from well-to-do persons.

Mr. Benson withdrew his amendment.

On Clause 7 (Contributions by local authorities towards provision of homes and hostels) Mr. TURTON moved an amendment to extend the application of the clause. He said the National Council of Mental Hygiene and the Institute for the Scientific Treatment of Delinquency feared the clause as it stood would omit many valuable clinics and hostels.

Mr. LLOYD said that under the Mental Treatment Act, 1930, Section 6 (2) and Subsection (3 *c*), local authorities already had the power to contribute to the funds of voluntary associations formed for the prevention and treatment of mental illness.

Mr. TURTON pointed out that later, by Clause 19, the committee was to approve a large body of cases which would not come under the Mental Treatment Act, but would be dealt with in clinics approved by the Board of Control. It was necessary to make provision under this clause that the local authority should be able to make the contribution for which he asked.

Mr. LLOYD said the meaning of "mental treatment" under the Mental Treatment Act was not restricted to ordinary insanity but was widely interpreted. Local authorities therefore had wide powers for making contributions, and it was unnecessary to duplicate such powers in the Bill. Contributions would normally be made to the clinics in respect of the individual probationers who were received.

Mr. Turton withdrew his amendment.

On Clause 10 the Attorney-General assured Mr. Silkin that a report on a person committed to a remand home would include a medical report on physical and mental condition and information about the person's environment. Answering Sir Francis Fremantle and Mr. Ede, Mr. LLOYD explained why the limits for reception of young persons remanded were to be fixed at 14 years and 23 years. He said those under 17 would normally be in the remand homes of the local authorities. Those of 17 to 23 would go to remand centres. Great attention would be paid to the classification of these young people in the remand centres.

The discussion was adjourned until February 14.

The standing committee of the House of Commons which is considering the Criminal Justice Bill resumed its sittings on February 14. On Clause 11 (Provision of State remand homes) Sir FRANCIS FREMANTLE moved to make the provision of facilities for observation compulsory in the remand homes provided by the councils of counties and of county boroughs. Sir SAMUEL HOARE said that with the very small numbers of young people on remand in country areas Sir Francis Fremantle's proposal was impracticable. The Home Office wished to make a success of this psychological treatment, and would be helped to do so if it was restricted to institutions where, because of the numbers in them and the staff available, proper treatment could be secured.

Sir Francis Fremantle withdrew his amendment.

Miss WARD moved to leave out the limitation that observation might be arranged for a young person "on whose mental condition a medical report" was desirable and to substitute a provision that it might be ordered for a young person in whose case a report might be desirable. She said the change would ensure that there was no limitation to the type of report. Sir ERNEST GRAHAM-LITTLE supported the amendment. He said that, when physician to a children's hospital, he had a small girl under observation for many years. Given thyroid she was sensible and normal; without the thyroid she was disorderly, dirty, and completely irresponsible. He would like it to be possible for that kind of case to be kept under observation by skilled persons.

Sir DONALD SOMERVELL said the Home Secretary intended that State remand homes should be for the problem child, and it was therefore necessary to have in the clause the words which made that clear. The amendment proposed by Miss Ward would open the doors of these homes to a wider category of cases than they were intended for. It was not possible to have any definition of the problem child. The problem arose out of the mental condition, which might be due to a fractured skull, to a glandular condition, to malnutrition or general debility, or to some psychological causes not directly related to some physical state. There was nothing in the Bill which would cut down a report on the aspects of mental and physical health to be considered under the observations made in State remand homes.

Miss Ward withdrew her amendment.

Sir ARCHIBALD SOUTHBY moved to provide that any council acting under the clause might, if facilities for observation were available at any other institution or place, arrange for the use of those facilities for the observation of any person detained in a remand home provided for that area by the council. He wished to guard against setting up establishments in which all the problem children would be concentrated. Having set up a vast establishment, the desire would be to fill it, and the medical profession would want to carry out experiments on the children there. It would be a pity if by this procedure voluntary organizations which were doing work for the child population were "frozen out."

On the advice of Sir Donald Somervell the committee agreed to the amendment.

The committee resumed on February 16, and agreed to Clause 12. During the discussion it was pointed out that the intention of this clause was to provide an alternative to corporal punishment. Clause 13 (Provision of Howard Houses), and a subsequent clause concerning provision of Borstal institutions, were agreed to, and the committee adjourned until February 21.

Hospitals' Electricity Supply in War-time

Mr. EMERY asked on February 9, in view of the recent breakdowns of electric power stations causing inconvenience and danger to life in hospitals, what steps Dr. Elliot proposed to ensure that emergency lighting sets were provided in all such buildings. Dr. ELLIOT said he was unaware of circumstances which called for any action on his part. He would inquire into any cases brought forward by Mr. Emery.

On the same day Mr. PERKINS asked whether Dr. Elliot intended to make funds available for provision of essential stand-by electric plants for hospitals. Dr. ELLIOT replied that he assumed Mr. Perkins referred to plant for use in the event of failure of the normal supply in time of war. In so far as equipment of this kind was of no substantial peace-time use to the institution, a contribution to the cost might be made by the Exchequer. Normally provision should be made against the possibility of breakdown in peace-time, and therefore the question of grant would not arise.

The General Medical Council

Mr. DAVID ADAMS on February 9 asked Lord Winterton as representing the Lord President of the Council whether he intended to hold an inquiry into the relationship between the General Medical Council, the Medical Practitioners' Union, and the general public, in view of the fact that this union had issued a memorandum proposing that some entirely new body should take over the functions of the General Medical Council. Lord WINTERTON said the answer was in the negative.

Pasteurization of Milk

On February 13 Captain PETER MACDONALD asked Sir Reginald Dorman-Smith whether, in view of the fact that one of the principal difficulties in the way of expanding the consumption of liquid milk in this country was the unwillingness of the medical profession to co-operate until arrangements had been made to ensure a milk supply bacteriologically pure or pasteurized, he would consider the desirability of calling an early conference with representatives of the medical profession to ascertain on what basis it was possible to obtain co-operation in this matter.

Sir REGINALD DORMAN-SMITH, in reply, recalled that Dr. Elliot recently received a deputation from the British Medical Association, the Society of Medical Officers of Health, and the Joint Tuberculosis Council, who laid before him their views on the necessity for pasteurization. Sir Reginald said he would confer with Dr. Elliot on the prospects of useful results being achieved by such a conference as Captain Macdonald suggested.

Mrs. TATE asserted that pasteurization killed not only the vitamins but the hormones in milk. She asked the Minister to do nothing to encourage that "pernicious" practice. Dr. SUMMERSKILL denied Mrs. Tate's assertion.

Captain PETER MACDONALD said the attitude of many local authorities and medical officers of health was influenced by

the fact that they got no lead from the Ministry in this matter. He asked Sir Reginald to confer with Dr. Elliot to see that some definite lead was given. Sir R. DORMAN-SMITH said he realized there was more than one opinion on this question, and he would consult with Dr. Elliot.

Replying to Mr. Leach, Mr. BERNAYS said on February 13 that Dr. Elliot would consider a request, if made, to receive a deputation of the opponents of compulsory pasteurization of milk to deal with the statements made by the medical representatives at the deputation he received on February 8.

Emergency Hospitals in War-time

Mr. HORE-BELISHA told Sir Gifford Fox on February 14 that the limited number of buildings which appear suitable for emergency hospitals in time of war will be inspected. Those buildings which, after inspection, are found suitable will be notified to the Ministry of Health or the Department of Health for Scotland and the Office of Works, and, subject to their agreement, will be earmarked. In the case of buildings found not to be suitable for the War Office the suggestion is made that the offers might be renewed to the Ministry of Health or the Department of Health for Scotland. The War Office is providing its own basic requirements for hospital accommodation independently of these offers.

Conditions in Coastal Vessels

On February 14 Mr. OLIVER STANLEY told Mr. Ben Smith that he had seen the annual report of the Port of London medical officer of health, 1937, which referred to unhygienic accommodation, inadequate provision for the storage of food, cramped living quarters, excessive hours of work, and other unsatisfactory conditions, on vessels engaged in the coasting trade. Mr. Stanley added that general conditions of service in the coasting trade, as in other parts of the mercantile marine, were primarily matters for the National Maritime Board. As regards crew accommodation, a satisfactory standard for new ships was established by the revised instructions of 1937. Every effort was being made to bring the older ships so far as practicable up to a similar standard. Close contact in this matter was maintained between the Board of Trade surveyors and the port health officers.

Protection of First-aid Stations

In the House of Lords on February 16 Lord TEYNHAM called attention to the air raid precaution policy of the Government, particularly in regard to the provision of bomb-proof shelters.

Lord HORDER said that in the event of war no really adequate security could be afforded to those who continued work in a dangerous area except by some form of bomb-proof shelter. A particular body of persons who must inevitably work in the danger zone were the doctors. An intensive air raid must paralyse for a time all activity even on the part of medical men and women at a first-aid shelter. Owing to the congestion of thoroughfares and the blocking of streets by debris many casualties must be treated where they arose and doctors must be there to treat them. Though he subscribed to the policy of transporting as early as might be as many casualties as possible from the danger zones to less dangerous zones, there must be first-aid stations, and they must be worked by doctors. They must be in some bomb-proof place, and he could think of no bomb-proof place adequate for the purpose except fairly deep underground shelters. The question of money and expenditure could not possibly enter into this matter of adequate shelter for the work which went on in first-aid stations. At this moment 95 per cent. of medical men and women in this country were enrolled by the British Medical Association, and from that register doctors would be earmarked for special services. The first series of air raids must count among its casualties a large number of doctors, and the replacements were limited. Doctors' equipment, too, was very difficult to replace in an emergency and must be in an adequate shelter. The morale of the patient was also important in obtaining successful results, and the question of the cost of providing the shelters seemed to him incongruous in relation to his plea. The Minister of Health should say to his colleagues: "I must have doctors and their work underground in the danger areas, and therefore let me begin forthwith to prepare for this necessity."

Lord GREVILLE said there had been consultations with the Ministry of Health. So far nothing had been heard about the provision of first-aid shelters for the treatment of wounded. The hospital with which he was concerned was asked recently to take charge of certain first-aid stations, and was told that these would probably be in the open in two London squares. He begged the Ministry of Health to consider the lives of doctors and nurses as the most important things in any air raid precautions scheme. They would not get a proper medical scheme until the treatment of hospital patients, the evacuation of the wounded, and first-aid treatment were placed under some medical director with knowledge of what happened in the last war.

Lord BIRKENHEAD, replying to the debate, said a Bill would be brought in very shortly dealing with air raid protection, but he could not anticipate its contents. The questions put by Lord Horder about underground dressing stations were under the consideration of the Minister of Health, who would give his decision in due course.

The debate then terminated.

Nottingham Hospitals

Mr. A. M. LYONS asked on February 16 whether the attention of Dr. Elliot had been called to a report on the internal conditions of the Nottingham Isolation Hospital to the effect that certain wards and beds were vermin-infested; whether he had seen the complaints to this effect from nurses and former patients; and what steps he proposed to take. Dr. ELLIOT said he would cause inquiry to be made into this.

Mr. LYONS further asked when an inspection was last made by any officer of the Ministry into the internal conditions of the Isolation Hospital, the City Institution, and the City Hospital, respectively, all in Nottingham. Dr. ELLIOT replied that the last complete inspection of the whole institution was made on January 18 to 21 and February 10 and 11, 1932. One of his medical officers inspected the City Hospital on October 17 and 18, 1938. The same medical officer and his general inspector made an inspection of the City Institution on January 30 and 31, 1939, and also visited the City Hospital on these dates.

Drugs for Panel Patients.—Mr. THORNE asked on February 6 whether panel doctors were expected, and permitted under the regulations, to supply any drug they wished to panel patients. Mr. ROBERT BERNAYS, in reply, said insurance practitioners were required by their terms of service to order any drugs which were necessary for the adequate treatment of their patients.

Camps for Evacuation.—Sir JOHN ANDERSON announced on February 13 that the Government has decided to introduce legislation establishing a public corporation for England and Wales and another for Scotland which would be empowered to construct and manage hutted camps for billeting under any evacuation scheme in time of war, and to take children in relays from urban areas in time of peace. A start will be made on fifty camps, each designed to accommodate about 350.

Workmen's Compensation.—Returns collected by the Home Office of workmen's compensation in 1937 show that the numbers of cases in which compensation was paid bore the following percentages to the numbers employed: shipping, 5.93; factories, 3.97; docks, 11.27; mines, 23.23; quarries, 10.45. The cases include those continued from previous years.

Diphtheria Immunization: Irish Law Suit.—Mr. LEACH asked the Minister of Health on February 16 if his attention had been drawn to the case of twenty-five children attending

the Irish College at Ring, Waterford, who contracted tuberculosis, from which one had since died, as the result of inoculation against diphtheria by a prophylactic supplied by the Wellcome Foundation of Snow Hill Buildings, London; if this prophylactic was the same as that freely used in this country; and what steps he was taking to prevent a similar occurrence here. Dr. ELLIOT said the reply to the first and second parts of the question was in the affirmative. The outbreak in Ireland took place in November, 1936, and, as the hon. member was informed in reply to a question on June 24, 1937, careful inquiry concerning the prophylactic used was made by medical officers of the Department as soon as the matter was brought to the Minister's notice. As regards the last part, the manufacture for sale in, and the importation into, this country of diphtheria prophylactic were strictly controlled under the Therapeutic Substances Act, 1925.

Report on Tuberculosis in Wales.—The report of the committee presided over by Mr. Clement Davies on the problem of tuberculosis in Wales is in process of printing and will shortly be available for consideration by the various bodies concerned. In the meantime Dr. Elliot cannot state what steps it may be appropriate to take respecting the matters dealt with in the report.

Emergency Plans.—Dr. Elliot says that those who accept the care of children under the evacuation scheme will not be responsible, under the schedule of payments, for any medical expenses which may be necessary in case of illness of the children. Representatives of the universities are in consultation with Sir John Anderson with a view to preparing plans to enable university education to continue so far as may be appropriate in time of war, and for securing those special services to war-time needs which the universities may be able to render.

Notes in Brief

Sir Samuel Hoare has communicated with representatives of employers on the question of modifying the three-year rule in the Various Industries (Silicosis) Scheme. After receipt of their replies he will consider the best method of meeting cases of hardship.

No outbreaks of foot-and-mouth disease occurred in attested herds during the past six months.

It will not be possible for the Government to introduce this session a Bill based on the Report of the Royal Commission on Safety in Mines, but the Government accepts the report in its general sense. It will consider action by Regulations where that is practicable and also the reorganization and strengthening of the Mines Inspectorate.

For use as emergency hospitals in war 131 buildings have been offered to the War Office. None has been definitely accepted or refused.

Medical News

Dr. W. E. Gye, F.R.S., Director of the Imperial Cancer Research Fund, will deliver a lecture on "The Present Position of the Cancer Problem" at St. Thomas's Hospital Medical School on Monday, March 20, at 5 p.m.

On Friday, March 24, at 8.30 p.m., a debate on the motion "That the institution of a whole-time State medical service would be in the interest of the nation's health," arranged by the Fellowship of Medicine (1, Wimpole Street, W.), will be held in the botanical theatre, University College, Gower Street, W. The motion will be proposed by Mr. Somervile Hastings, M.P., and Dr. D. Stark Murray, and will be opposed by Sir Henry Brackenbury and Dr. Frank Gray. Attendance is restricted to members of the medical profession, and admission will be by ticket only. Until March 1 tickets will be issued only to members and associates of the Fellowship of Medicine in order of application.

The annual provincial meeting of the Tuberculosis Association will be held at Cambridge from Thursday, March 30, to Saturday, April 1.

The annual scientific meeting of the International Organization against Trachoma will be held on Friday, April 21, at the Royal Society of Medicine, 1, Wimpole Street, and not as previously stated. The subject for discussion is: "The incidence and clinical type of trachoma met with in Europe and North and South America—that is, in countries which are commonly considered to be non-trachomatous." The openers will be Dr. Lavery (Dublin), Dr. Harry Gadle (Chicago), and Mr. Arnold Sorsby (London). A short discussion will follow on the treatment of trachoma by sulphanilamide and its congeners. Those who wish to speak are invited to communicate with the President of the Organization, 33, Welbeck Street, London, W.1. Reports of the proceedings will be published in the *International Review of Trachoma.*

A special meeting of the Institution of Heating and Ventilating Engineers will be held at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W., on Wednesday, March 1, at 7 p.m., when Mr. Walter L. Fleisher will give an address on "Air Conditioning in Industry, with Particular Reference to Physiological Aspects."

The first sittings of the Royal Commission on Workmen's Compensation for the purpose of taking evidence are being held this week at Montagu House, Whitehall, S.W. They are open to the public and the Press. The Commission is now prepared to receive from persons and organizations interested applications to give evidence on matters within its terms of reference. All applications should be accompanied by a statement of the heads of the proposed evidence. A copy of the Commission's terms of reference may be obtained from the Secretary, Mr. F. Popplewell, whose temporary address is Metropole Buildings, Northumberland Avenue, W.C.2.

The following German congresses will be held in March: Balneology and Climatology, March 23 to 26, at Vienna; Anthropology, 23 to 26, at Munich; Investigation of the Circulation, 25 and 26, at Nauheim; Neurologists and Psychiatrists, 26 to 28, at Wiesbaden; Microbiology, 27 to 30, at Vienna; Internal Medicine, 27 to 30, at Wiesbaden.

The Franco-Jugoslav Medical Congress will be held in Paris from March 2 to 4 under the presidency of Professor Emile Sergent. Further information can be obtained from Dr. André Ameline, 37, Rue Vaneau, Paris.

General meetings of the British Association of Radiologists and the Society of Radiotherapists of Great Britain and Ireland were held on February 17, and it was agreed by both bodies to amalgamate under the title of Faculty of Radiologists. The work of the Faculty will be carried on at the old office of the British Association of Radiologists at 32, Welbeck Street, London, W.1.

The third National Congress of Passive Defence (A.R.P.) was held in Paris on February 4. Its eight commissions formulated resolutions which were passed at the plenary session at the end of the day. The subjects dealt with included medical services to be rendered in the event of an attack from the air. Great Britain and Belgium sent representatives who gave an account of the work of their respective associations.

On February 14 Queen Mary visited Luton, Bedfordshire, to open the new Luton and Dunstable Hospital. Her Majesty, accompanied by Dr. John W. Bone, president of the hospital, afterwards inspected the building, which has cost £140,000. The new building is to replace Bute Hospital, which was built in 1882 and reconstructed in 1911; it will accommodate 170 patients, and the plans allow for future extension to take 132 more patients. The new facilities include a fracture clinic, the first in Bedfordshire. Queen Mary was the first to sign the visitors' book, and she also unveiled a commemorative tablet. Dr. Bone said that the accommodation could be increased to 500 beds at once on the existing site if a scheme for national defence rendered such a course necessary. The change-over from the present premises is expected to be complete by March 25.

The London Voluntary Hospitals Emergency Bed Service (10, Old Jewry, E.C.2) announces that on Sunday last the 5,000th application was received for the urgent admission of a patient to hospital. The patient was a child suffering from a gastric complaint and was admitted to the Evelina Hospital. The Service was started in June last, and up to the end of the year had dealt with about 3,000 cases. In 1939, however, the number of cases dealt with daily has increased greatly. During January alone about 1,000 cases were dealt with, and much the same figure is likely to be reached in February.

How serious is the menace to life and health constituted by fireworks is shown by the Fourth of July (a legal holiday in the United States) casualties summarized in the *Journal of the American Medical Association*, January 21, p. 236. In 1937 (as mentioned in these columns on January 22, 1938) there were 7,205 injuries with twenty deaths. In spite of the wide publicity which these figures received, the total number of casualties in 1938 increased to 7,933, twenty-five being fatal. Nearly three times as many people lost the sight of one or both eyes as in 1937, and there were over twice as many amputations.

The January issue of the *Leprosy Review* is a special East African number containing the reports of the Medical Secretary of the British Empire Leprosy Relief Association on his recent visits to ten different countries, chiefly in East Africa. This number is full of interesting illustrations, and should be of much value to those interested in this disease.

A gold medal is awarded annually by the Hunterian Society for the best essay written by a registered general practitioner resident within the British Empire on a subject selected by the society. Competitors—men or women—must be engaged in general practice. The essay must be unpublished and original and be based on the candidate's own observation, but it may contain excerpts from the literature on the subject provided reference is made to the articles from which they are taken. The subject for 1939 is "The Treatment of Obesity in General Practice," and for 1940, "The Treatment of Tonsillar Infections in Children." Candidates should obtain a copy of the rules governing the competition from the honorary secretary, Mr. Alex E. Roche, 140, Harley Street, W.1, before sending in their essays, which must reach him by December 31. The gold medal for 1938 was awarded to Dr. James E. Outhwaite of Yeadon, Leeds, for his essay on "The Management of Inoperable Malignant Disease in General Practice."

The British Red Cross Society is sending Major-General Sir John Kennedy as its representative to the South of France to ascertain in what way the British Red Cross Society can best help with the Spanish refugees.

EPIDEMIOLOGICAL NOTES

Infectious Diseases in England and Wales during January, 1939

In the four weeks ending January 28, 6,528 cases of scarlet fever, 5,051 cases of diphtheria, 6,624 cases of pneumonia (primary and influenzal), and 91 cases of enteric fever were notified in England and Wales, being 70 per cent., 93 per cent., 105 per cent., and 96 per cent. respectively of the expected numbers deduced from the median values of the corresponding weeks of the years 1930–8. Notifications of diphtheria during the week under review showed an increase in England and Wales, in which London shared, but deaths fell in both. While a trivial fall in scarlet fever was observed for the whole country, in London an increase of nearly 20 per cent. was recorded.

Influenza

According to the latest available reports influenza of a mild type is prevalent in Switzerland, Hungary, Belgium, Denmark, and Ireland.

In *England and Wales* notifications of pneumonia (primary and influenzal) rose during the week ended February 11 from 1,435 to 1,817, and in London from 125 to 172. During the same period deaths from influenza rose from 210 to 265 for the whole country and from 26 to 41 for London, while the annual death rate rose from 14.4 to 16.5 per 1,000 and from 13.6 to 16.8 per 1,000 respectively. In Eire and Northern Ireland incidence declined slightly, but deaths were increased except in the latter country.

In *Scotland* the prevalence of influenza, as indicated by returns of notified cases of acute influenzal pneumonia, exceeded expectation in the first week of the present year, and this excess continued appreciably until the middle of February, the total of 397 notified cases being 77 per cent. more than the median values for 1931–7. For the same period the number of notified cases of acute primary pneumonia was 2,221, representing 6 per cent. above expectancy. The combined figures show an excess until the middle of February amounting to 27 per cent. The total of 224 deaths attributed to influenza is nearly five times as great as in the same six weeks of 1938, but although notifications have fallen there is yet no clear indication that deaths have returned to normal values. The present outbreak has not been nearly so extensive or so fatal as previous epidemics of the present decennium. Notified cases of influenzal and acute primary pneumonia, for example, in the first six weeks of 1933 and 1937 numbered respectively 3,705 and 4,303, compared with 2,618 in the present year, and deaths attributed to influenza numbered 559 in 1933 and 965 in 1937, compared with only 244 in 1939. Based upon the death returns for the sixteen principal towns, older people seem to have suffered rather more severely in 1939 than in the 1937 epidemic. Of the deaths in those towns in January, 1939, 54 per cent. were at ages over 65, whereas in January, 1937, only 40 per cent. of the influenza deaths were in persons of these ages. Young adults, aged 15 to 45, contribute only 8.7 per cent. of the total, compared with 22.4 per cent. in the 1937 epidemic. Clinically, the outbreak was relatively mild, with the usual distinctive picture of short sharp fever and prostration followed by troublesome cough; major complications were relatively few and incapacity of brief duration.

In Germany deaths attributed to influenza rose from 100 to 108 in the week ended January 28. During the same period deaths from pneumonia of all kinds fell from 587 to 501 and the general death rate in the 57 towns (population 100,000 or over) from 13.9 to 13.2 per 1,000. In Denmark notifications of influenza at Copenhagen for the week ended February 4 were 4,423, compared with 2,433 in the previous week. In Switzerland influenza was reported in twenty cantons: 3,353 cases at Zürich, 1,650 among school children at Berne, and 1,641 at Basle (2,783 in the previous week). The figures relating to the week ended February 11 are available from Hungary: complicated cases declined from 264 to 234 for the whole country and from 31 to 20 in Budapest.

Typhus in Europe in 1938

During 1938 a decrease in the incidence of typhus was observed in Bulgaria, Bessarabia (principal epidemic focus of Rumania), the western districts of Yugoslavia, and the south-east of Poland. There is no information about the incidence of the disease in the U.S.S.R. In Poland case fatality was 5.1 per cent. (over 6 per cent. for the years 1934–6), compared with slightly over 8 per cent. in Rumania.

Yellow Fever on the Gold Coast in 1938

During 1938 15 confirmed cases, all fatal, were reported in Colony 8, in Northern Territories 5, in Togoland 2—compared with 75 cases in the previous year. Fourteen of the 15 cases were in males, 5 being in Europeans, of whom 4 were road contractors' foremen, indicating the danger of infection to Europeans living under doubtful rest-camp conditions in areas where domestic mosquito control is impracticable.

No. 6

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 11, 1939.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for : (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland. Median values for the last 9 years for (a) and (b).

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for : (a) The 126 great towns (125 in 1938) in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases ; a blank space denotes disease not notifiable or no return available.

Disease	1939					1938 (Corresponding Week)					1930–38 (Median Value Corresponding Weeks)	
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)	(a)	(b)
Cerebrospinal fever	30	4	14	5	2	35	6	11	—	—		
Deaths		2	4				1	2				
Diphtheria	1,280	127	206	46	16	1,738	203	279	78	43	1,363	203
Deaths	29	2	7	2	1	29	3	6	2	1		
Dysentery	48	8	12		—	242	91	129		—		
Deaths				—	—				—	—		
Encephalitis lethargica, acute	3	1	—		—	2	—	1		—		
Deaths		2					2					
Enteric (typhoid and paratyphoid) fever	28	3	10	2	—	21	3	5	9	1	24	
Deaths	1	—	—	1	—	1	—	—	—	—		
Erysipelas			86	5	8			75	8	7		
Deaths		—					2					
Infective enteritis or diarrhoea under 2 years												
Deaths	50	16	8	6	5	65	20	9	8	5		
Measles		20	42		4			1,551		617		
Deaths	1	—	—	1	—	40	6	20	—	19		
Ophthalmia neonatorum	92	11	22		—	108	9	33		1		
Deaths												
Pneumonia, influenzal*	1,817	172	60	5	11	1,155	79	6	5	25	1,662	170
Deaths (from influenza)	265	41	48	2	1	40	3	5	—	2		
Pneumonia, primary			292	6				220	18			
Deaths		30		27	17		16		28	19		
Polio-encephalitis, acute	4	—				1	—					
Deaths		—					—					
Poliomyelitis, acute	14	1	—		—	9	1	—		1		
Deaths		1					—					
Puerperal fever	9†	9	16	4	1	7†	7	18	2	—		
Deaths		—					2‡					
Puerperal pyrexia	172	18	27		—	177	13	24		2		
Deaths												
Relapsing fever	—	—			—	—	—	—	—	—		
Deaths						—	—	—	—	—		
Scarlet fever	1,677	163	337	45	75	2,326	193	471	108	83	2,269	225
Deaths	3	1	1	1	—	6	—	1	—	1		
Small-pox	—	—	—		—	—	—	—	—	—		
Deaths	—	—		—	—	—	—	—	—	—		
Typhus fever	—	—	—	—	—	—	—	—	—	—		
Deaths				—	—	—	—	—	—	—		
Whooping-cough		250	536		44			58		8		
Deaths	17	3	15	2	1	24	4	3	—	1		
Deaths (0–1 year)	486	75	116	50	30	458	76	80	52	38	*	
Infant mortality rate (per 1,000 live births)	74	62				76	63					
Deaths (excluding stillbirths)	6,731	1,320	881	282	180	4,866	921	712	228	178		
Annual death rate (per 1,000 persons living)	16.5	16.8	17.8	19.0	16.0	12.0	11.6	13.4	15.4	15.8		
Live births	6,559	1,072	870	334	228	6,688	1,271	913	313	232		
Annual rate per 1,000 persons living	16.1	13.7	17.6	22.5	20.2	16.5	16.0	18.6	21.1	20.6		
Stillbirths	274	34	41			301	49					
Rate per 1,000 total births (including stillborn)	40	31	45			43	37					

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† After October 1, 1937, puerperal fever was made notifiable only in the administrative county of London.

‡ Deaths from puerperal sepsis.